

PAVEMENTS FOR THE WASSEL & BRAMBERG  
AUSTIN SUBDIVISION OF CHICAGO, ILLS.

BY

R. B. BROWER

E. EDELSTEIN

E. A. FOY

H. W. HEMPLE

ARMOUR INSTITUTE OF TECHNOLOGY

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Plans, specifications, and  
estimate of cost for

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# A THESIS

PRESENTED BY

Ralph Benjamin Brower

Erwin Edelstein

Edgar Allanson Foy

Henry William Hemple

TO THE

PRESIDENT AND FACULTY

OF

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## Foreword.

The authors are indebted to Mr. Hill, Engineer of the Board of Local Improvements of the City of Chicago, for permission to use the specifications and cost data of all pavement construction completed during the year, 1915, in the City of Chicago.

To Professor A. E. Phillips and his assistants, especially Associate Professor, H. J. Armstrong, the authors wish to express their appreciation for guidance and many courtesies given during the preparation of this thesis.

To Mrs. Beveridge and her assistant Miss Brooknells, the authors are indebted for the "Bibliography on Modern Pavements."

R. B. Brower.

Erwin Edelstein.

E. A. Foy.

H. W. Henole.



PLANS, SPECIFICATIONS,  
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ESTIMATE OF COST  
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It is our purpose in this thesis to prepare the complete set of plans and an estimate of the cost of the pavements for the Wassel and Bramberg Austin Subdivision of Chicago, Illinois in accordance with the Specifications of the Board of Local Improvements of the City of Chicago. (See Plate 1). The work undertaken is developed from the survey to the letting of the contract.

All sewers, manholes, and catch basins were found to be in place, so that no provision had to be made for installing or adjusting them. The rights of way of the street railways on Division Street and North Avenue have been paved and conform to the required city grade.

The choice of the type of surfaces for the streets under consideration was determined entirely by the present practice of City of Chicago. With this in view, the business streets, Division Street and North Avenue were paved with creosoted wood blocks, and the remaining streets, which are residential, with sheet asphalt.

The field work was done by the authors, and the notes obtained are shown plotted on Plate two (2). The grades of the curbs of the finished streets were given by the Engineering Department of the Board of Local Improvements.





The grades of the crowns of the streets were made to conform with the corresponding grades of the curbs in accordance with common practice. These grades, as well as those of the gutter, are shown plotted on Plate two(2).

The yardage of excavation or fill between stations was computed with the aid of data given on Plate two (2). The average end area formula

$$V = L \frac{A+B}{2 \times 27}$$

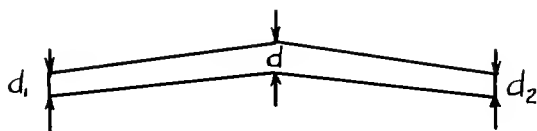
was used.

V volume in cu. yds.

A and B areas of end sections in square ft.

L distance between stations in feet.

A and B were determined as follows:



Let  $d$ ,  $d_1$ ,  $d_2$  be the depths at the center and sides of section respective:

Let  $W$  width of section.



$$A \text{ or } A_2 = \frac{d + 2d + d_2}{4} W.$$

A summary for each block and building line plat-form has been made showing the yardage of cut and fill; the number of square yards of pavement; the number of lineal feet of curb and gutter; the yardage of gutter or fill; and the number of inlet castings.

These items have been tabulated and multiplied by the average unit costs which have been obtained directly from the books of the Board of Local Improvements. The cost per lineal foot of frontage has been determined from which the assessment for each property owner may be made.



**SPECIFICATIONS**  
**for**  
**CREOSOTED WOOD BLOCK.**



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#### (1) INSTRUCTIONS TO BIDDERS

The contract of which these specifications are a part is drawn under an ordinance which was heretofore passed by the City Council of the City of Chicago, providing for the said improvement, and it is understood that the Contractor shall carefully examine the said ordinance, as , under the laws of the state of Illinois, the Improvement , as completed, must comply with the terms and provisions of the ordinance providing for the said improvement.

It is the intention of these specifications to



provide for this improvement in a complete, thorough and workmanlike manner. The Contractor to whom the work is awarded shall furnish all materials, labor, and appurtenances necessary to complete the work in accordance with these specifications, and anything omitted herein, that may be reasonably interpreted as necessary to such completion, the Engineer being the Judge, is to be merged in the prices bid for the improvement.

No bid will be accepted which does not contain an adequate or reasonable price for each and every item named in the schedule of quantities.

Bidders must satisfy themselves, by personal examination of the location of the proposed work, and by such other means as they may prefer, as to the accuracy of the estimates of quantities and shall not at any time after the submission of their proposals dispute or complain of such estimates of the Engineer nor assert that there was any misunderstanding in regard to the nature or amount of the work to be done.

Bidders must present satisfactory evidence that they have been regularly engaged in the business of laying Creosoted Wood Block Pavements, or are reasonably familiar



therewith, and that they are fully prepared with the necessary capital, materials and machinery to conduct the work to be contracted for to the satisfaction of the Engineers.

Bidders must state in their proposals the name and place of treatment of the blocks they propose to use; and shall furnish samples of oil in ample time so that the Engineers may make the tests it may deem necessary.

Bidders are especially notified that in the event of any disputes relating to the quality of the paving materials, all tests must be based upon the defined official methods approved by and on file in the office of the Engineer .

All bids must be made subject to the rights of the owners of a majority of the frontage, to contract for the improvement as provided for in Sections 80 and 81 of an Act of the General Assembly of the State of Illinois, entitled, " An Act Concerning Local Improvements," approved June 14, 1897; in force July 1, 1897; and the amendments thereto.



No bids will be accepted from any person or firms who may be in arrears to the City of Chicago upon debt or contract, or who may be in default, as surety or otherwise, upon any obligation to said City of Chicago, or behind specified time on any previous work. Companies or firms bidding for the work herein described must state in the proposals the individual names and places of the residence of the Officers or persons comprising such company or firm.

The Engineers expressly reserves the right to reject any or all bids to to accept bids separately as to any or all items in the schedule of quantities, or to accept any bid in the aggregate.

## (2) DEFINITIONS

Wherever the words "Engineers" occurs in these specifications they shall be interpreted to mean the Engineers in charge, and any of its authorized representatives; provided, however, that such persons shall be understood to represent said company only to the extent of the special duties imposed upon such representatives.

Wherever the word "Contractor" occurs in these





specifications it shall be interpreted to mean the person or persons, firm or corporation to whom the work herein specified is awarded and the agents, employes, workmen, or assignees, thereof.

Wherever the word "work" occurs in these specifications it shall be interpreted to mean the work including all material , labor and use of tools, necessary to complete the improvement in full compliance with the terms of these specifications.

Wherever the word "rock" occurs in these specifications it shall be interpreted to mean any material geologically in place and of a hardness when first exposed of three or greater in the scale of mineral hardness, which corresponds to the hardness of the transparent variety of calcite. Other materials shall not be classed as rock, although it may be more economical to remove the same by blasting.

Wherever the word "penetration" occurs in these specifications , without special qualification , it shall be interpreted to mean the degree of penetration recorded by the Dow penetration machine in the asphalt laboratory of the Engineers , fitted with a No. 2 needle weighted with



one hundred (100) grams acting for five (5) seconds on the material at a temperature of seventy-seven(77) degrees Fahrenheit.

Wherever the words "specific gravity" occur in these specifications, they shall be interpreted to mean the weight of a definite volume of the substance at the temperature stated compared with the weight of the same volume of distilled water at the same temperature.

### (3) CHARACTER OF WORK

All work shall be executed in the best and most workmanlike manner, and no improper materials shall be used, but all materials of every kind shall fully answer the specifications, or if not particularly specified, shall be suitable for the place where used and satisfactory to the Engineers.

### (4) ADJUSTMENT OF SEWER CATCH-BASINS AND MANHOLES.

The contractor shall, for the price bid per unit, lower or raise and adjust to the proper grade and line all covers to the sewer manholes and catch-basins; shall furnish and set new iron covers where needed; shall build new catch-basins and shall furnish and lay tile pipe to connect said basins to the sewers.



## (5) MASONRY.

The brick shall be of the best quality for the purpose for which they are intended, uniform in quality, sound and hard burned, free from lime and cracks, with a clear ringing sound when struck, whole and with edges full and square and of standard dimensions, viz: eight by four by two and one-quarter ( $8 \times 4 \times 2 \frac{1}{4}$ ) inches; they shall be of compact texture and, after being thoroughly dried and immersed in water for twenty-four (24) hours, shall not absorb more than fifteen (15) per cent in weight of water.

The mortar shall be made by carefully measuring and thoroughly incorporating one (1) part of natural cement with two (2) parts of clean, sharp sand in dry state, and mixing with clean water to the proper consistency, and shall be used while fresh. The use of mortar which has set and then been retempered will not be allowed.

All brick must be clean and thoroughly wet before being laid. The most perfectly formed brick and those with the smoothest surfaces are to be used in the inside courses, the smoothest edge of the brick being laid to the face. All joints and spaces between the brick shall



be thoroughly filled with mortar and each brick thoroughly bedded in mortar.

No joint shall exceed one-half ( $1/2$ ) inch in thickness, and all joints on face shall be trowel struck.

If it be necessary to build more than two (2) feet of brick work in adjusting the cover of any manhole or catch-basin, such excess shall be paid for at the rate of two (\$2.00) dollars per lineal foot.

#### (6) OLD CATCH-BASINS.

The covers of the catch-basins shall be taken off and the upper courses of the brick work removed and the brick work built up and cover set as specified for old manholes. The catch-basins shall be cleaned out and all open joints filled with fresh mortar. When necessary the new brick work shall be drawn over to one side so that the cover will occupy its proper position with reference to curb. When the catch-basin is not located in the line of the gutter an eight(8) inch inlet pipe shall connect the catch-basin with a suitable inlet constructed next to the curb.

The pipe connections from the old catch-basins to the sewers shall be examined at the expense of the





contractor, and if found defective shall be put in good condition at the expense of the city.

#### (7) OLD MANHOLES

The covers of the manholes shall be taken off and the upper courses of the brick work removed if they be defective or if it be necessary to set the covers at a lower grade. If it be necessary to raise the covers more than six (6) inches, the upper header courses shall be removed until the internal diameter of the brick is two (2) feet six (6) inches and the manholes shall be built up with new masonry to the proper grade and an iron cover set thereon, using the old cover if it be in a suitable condition.

The price bid per manhole shall include the cost of all the above work and material, including not to exceed two (2) feet of new brick work, excepting the new cover, if furnished.

#### (8) IRON COVERS

The contractor shall set all covers to the correct grade in a bed of mortar on top of the brick work above specified.



All new covers shall be of a good grade of cast iron. The curb shall weight not less than three hundred and ninety (390) pounds, and the lid shall weigh not less than one hundred and fifty (150) pounds, provided that if the catch-basins are to be built in the parkways lighter covers may be used weighing not less than three hundred and fifteen (315) pounds. Where catch-basins are in the gutters, the contractor shall provide manhole covers with perforated lids of a form adopted by the Board of Local Improvements of Chicago, October 24th, 1912. The covers and iron lids shall be of the size and form of the iron covers and lids as shown on plans on file in the office of the Board of Local Improvements of Chicago, Ill.

The price bid per new cover shall include the cost of the lid and the setting of the cover,, and shall be in addition to the,price of adjusting the manhole or catch-basin.

All old iron covers for manholes and catch-basins that are not needed on the work shall be carefully set aside by the contractor for the use of the engineers.



#### (9) BACK FILLING

The earth must be carefully replaced around all manholes and catch-basins and over all tile pipe laid under this contract, in such a manner that no further settlement will take place, and it must be thoroughly compacted.

#### (10) IRON INLET GRATINGS

When so directed by the Engineer, the contractor shall furnish and set a cast iron grating seventeen by twenty-four (17 x 24) inches of the form and dimensions shown on the standard plan of sewer manholes and catch-basins in the office of the Board of Local Improvements of Chicago, Ill. The grating shall be supported by a cast iron frame and brick foundation and shall be connected to the catch-basin by means of an eight (8) inch pipe in the manner shown by said drawing.

The price bid per grating shall include the cost of all material and labor above specified, except the tile pipe.

#### (11) STONE CURBING.

The stone curb must be of the best quality of sandstone, straight and free from cracks, seams and pockets



or drill holes. Buff-colored sandstone will be rejected.

The top and road-way face must be machine dressed and with a corner rounded to a radius of one and one-half (  $1\frac{1}{2}$  ) inches. The face must be dressed to a depth of fourteen (14) inches from the top. The back side of the stone must be "pointed" to a depth of at least (3) three inches so as to leave the top of the stone three.and.one-half.( $3\frac{1}{2}$ .) inches in thickness throughout. The ends shall be dressed smooth and square to the full depth of the stone so as to make close joints. The bottom of the stone must be straight and parallel with the top.

The stones after being dressed shall be not less than ...Five.....(.5) inches thick, eighteen (18) inches deep and five (5) feet long.

The stone curb shall be set to the established grade and in a continuous line on each side of the street 25'-0" (on North Ave..and.21'-0" (on Division St. from and parallel with the center line thereof, except at all intersections of streets and alleys, where the curb shall be returned to the street line. All grades and lines will be given by the Engineer.





The curbstones shall be supported at each joint by being firmly bedded upon a layer of Portland Cement concrete twenty-four (.24) ... inches in length, eighteen .. (...18....) inches in width and six (6) inches in depth. The roadway face of said layer shall conform with the roadway face of the curbstones and ..twelve.... (...12. ) inches of each end of each of said curbstones shall rest upon said layer. A layer of Portland cement concrete twenty-four....(24) inches in length , six (6) inches in width and ..eighteen....(18) inches in depth shall be placed at the back of said curbstones. The top of said last mentioned layer shall be six (6) inches below the top of said curbstones, and the roadway face of said last mentioned layer shall extend along the back of said curbstones for a distance of ..twelve....(12) inches from each end of each of said curbstones, and shall support said curbstones. The above described layers of Portland cement concrete shall be constructed at the same time so as to form a monolithic mass and shall be of the same kind and quality as that used in concrete foundation of the roadway hereinafter described.

At each street intersection there shall be furnished and set four (4) and at each half intersection two (2)



circular stones ( or concrete) of a radius of three (3) feet. These stones must be neatly dressed on top and on the face for a distance of fourteen (14) inches down. No extra charge will be allowed for circular corner stones.

Where stone curb is specified to be reset it shall be recut and set to a proper line and grade, and new blocking furnished where necessary.

The curbing shall be back-filled to the top and the filling at that point shall be level and four (4) feet wide and then shall have a slope of one and one-half (1 1/2) horizontal to one (1) vertical. The curbing shall be underfilled where necessary.

The price bid per lineal foot for curb or for curb recut and reset must include all cost of furnishing the necessary blocking.

Where the roadway is narrowed by this improvement the contractor shall remove all the curbing and paving now on the street. The price bid per lineal foot for the curbing must include all cost of removing the old curbing and paving.



(12) PREPARATION OF THE SUB-GRADE.

Where filling is required it shall be of earth or cinders free from animal or vegetable matter, and shall be deposited in layers and thoroughly compacted.

In all cases where back-filling of curb is required, it shall have a berme of at least four (4) feet at the top thereof, with a slope of one and one-half ( $1\frac{1}{2}$ ) horizontal to one (1) vertical.

Where the earth adjacent to the back of the curb is above grade, it shall be removed so as to form a slope of one and one-half ( $1\frac{1}{2}$ ) horizontal to one (1) vertical, rising from the back of the curb to the surface of the ground.

Where cutting is required, the earth must be excavated to such a depth as may be necessary to bring the roadway to the proper sub-grade after being thoroughly compacted.

The contractor shall remove all spongy material or other inferior or vegetable matter that may be in the way of making this improvement.

All approaches connecting said street with other streets or alleys intersecting shall also be cut or filled



so that the same will have a slope of not more than one (1) vertical to ten (10) horizontal, and shall be secured from settlement adjoining the pavement.

The roadway shall be brought to the proper sub-grade by cutting or filling, and thoroughly compacted and secured from further settlement by flooding, ramming or rolling, or all, as may be deemed necessary by the engineers.

The contractor shall bid with the express understanding that all necessary precaution must be used in preparing the sub-grade so as to support the pavement permanently, and so that the pavement will not sink, thereafter, and, at the expiration of ...five....(5.) years after the acceptance of the work, will still be at the original grade.

This clause will not be waived on account of any trenches or holes made in the street by any corporation or private party prior to the laying of the pavement.

The price bid for cutting or filling, if in separate items, or the price per yard for paving, must include all cost of bringing the sub-grade to its proper position and compaction and securing the same from settlement.





### (13) CONCRETE FOUNDATION

On the sub-grade as above prepared shall be laid a foundation of Portland cement concrete to a uniform thickness of six (6) inches. The concrete shall be made of Portland Cement and sand or limestone screenings in combination with stone, slag or gravel.

The sand used in making the concrete shall be of sizes ranging from one-quarter ( $1/4$ ) inch down to the finest, and shall be free from dirt, dust and other impurities. No wind-drifted sand shall be used.

The limestone screenings used in making the concrete shall be of varying sizes ranging from one-quarter ( $1/4$ ) inch down to the finest, and shall be free from dirt, dust and other impurities. The screenings shall be made of the best quality of limestone; screenings made from quarry strippings or stone containing bituminous material will not be accepted.

The stone, slag or gravel used in making the concrete shall be of the best quality of each of the respective materials to be used, clean, free from dust, and shall be of varying sizes. The maximum dimension of any piece of such stone, slag or gravel shall not exceed two (2) inches



nor shall the minimum be less than one-half (1/2) inch.

The concrete shall be mixed by approved batch machine mixers or on movable, tight, iron platforms of such size as to accomodate the manipulations herein specified. The cement, sand or limestone screenings and stone, slag or gravel, shall be mixed in the following proportions by volume: One (1) part of cement, three (3) parts of sand or limestone screenings and six (6) parts of stone, slag or gravel. The sand or limestone screenings and cement shall be thoroughly mixed dry, after which water shall be added and the mixture made into a stiff mortar. The stone, slag or gravel shall be immediately incorporated in the mortar and the mass thoroughly mixed, water being added if necessary as the mixing progresses, until each particle of stone, slag or gravel is covered with mortar.

The barrows or appliances used in measuring the parts of cement, sand, limestone, screenings, stone, slag or gravel shall be of such size and shape as may be approved by the Engineers.

The sand, limestone screenings, stone, slag or gravel, when delivered on the street, shall be kept clean



until used.

The concrete shall be deposited in a layer on the sub-grade in such quantities that, after being thoroughly rammed in place it will be of the required thickness and the upper surface will be true and uniform and ....four....(4) inches below and parallel with the surface of the wood blocks. " Slushing" will not be permitted.

In hot weather the concrete shall be kept moist so as to prevent checking. It shall be protected from injury and shall lie at least seven (7) days before being covered with the wearing surface or a longer time if deemed necessary by the Engineers.

#### (14) PORTLAND CEMENT.

The Portland cement used in this improvement shall be subject to the following inspection and tests, and must be approved by the Engineers before it is incorporated in the work.

**FINENESS.** It shall be so ground that ninety-two(92) per cent will pass through a standard No. 100 sieve, having 10,000 meshes per square inch, made of wire cloth, No. 40 wire, Stubbs gauge.



**SOUNDNESS.** It shall meet the requirements of the following boiling tests: A pat of neat cement, three and one-half (  $3 \frac{1}{2}$  ) inches in diameter, one-half ( $\frac{1}{2}$ ) inch in thickness at the center and tapering to a feather edge, having been made on glass and having remained in air twenty-four (24) hours, protected by a damp cloth, together with broken briquettes of neat cement which have remained in air one (1) day and been immersed in water six (6) days, shall, after being subjected to the action of steam four (4) hours and then immersed in boiling water four (4) hours, show no checking, warping or swelling.

**SETTING.** The cement, when mixed with twenty-eight (28) per cent. of water, by weight, shall take initial set in not less than forty-five (45) minutes, as determined by the Gilmore needle.

**STRENGTH.** Briquettes shall develop the following ultimate tensile strengths per square inch of section: Neat, one (1) day in air and six (6) days in water, five hundred (500) pounds. One (1) part of cement to three (3) parts of torpedo sand or limestone screenings, one (1) day in air and six days (6) in water, two hundred (200) pounds, and shall show a gradual increase in strength of twenty





(20) per cent. at the end of twenty-eight (28) days.

Samples of cement which it is proposed to use in the work shall be submitted to the Engineers in such quantities and at such time and place as will enable them to make all required tests.

The Engineers reserve the right to reject any cement which is not satisfactory, whether for reasons mentioned in these specifications or for any good and sufficient cause.

All cement shall be delivered on the work in approved packages, bearing the name, brand or stamp of the manufacturer, and shall be thoroughly protected until used.

#### (15) CUSHION.

Upon the concrete foundation shall be spread a layer composed of one (1) part of Portland cement to four (4) parts torpedo sand, thoroughly mixed and dry, and in sufficient quantity to insure, when compacted, a uniform thickness of ...one... (1) inch. In surfacing said layer the contractor shall use such guides and templates as the Engineer may direct. Immediately before laying the blocks the mixture shall be wetted by means of a rose



head sprinkler with just sufficient water to partially cake it.

(16) CREOSOTED WOOD BLOCK WEARING SURFACE.

BLOCKS. Upon the cushion shall be set the creosoted wood blocks.

The blocks shall be cut from southern long... leaf.. yellow pine or tamarack timber. Only one kind of wood, however, shall be used on this work. The blocks shall be not less than five (5) inches in length, nor more than ten (10) inches in length, but shall average six (6) inches in length. The depth shall be three.... (3) inches, and the width shall be three and three fourths ( $3 \frac{3}{4}$ ) inches.

All blocks shall be made of sound timber and shall be free from any defects which will be detrimental to the life of the block or interfere with the proper laying of the same. Each block shall have at least sixty-six (66) per cent of heart wood.

The blocks shall be carefully protected from the effect of the sun and weather before and after treatment and until laid.



TIMBER. The timber shall be that known to the trade as "prime" timber and of a texture permitting satisfactory treatment as hereinafter specified, and shall be subject to inspection at the works in the stick or at any time during the process of preparation or thereafter. The timber shall be sound, square-edged, free from bark, shakes, large or loose or rotten knots, red heart, worm or knot holes, or any other defects which will be detrimental to its strength or durability. No second growth timber or loblolly pine will be accepted.

With southern .....long..leaf.. yellow pine timber, the annual rings in the three (3) inches measured radially from the center of the heart shall average not less than eight (8) to the inch.

When the timber for the blocks is only partially seasoned, the Engineers may require the same to be piled in such a manner and for such a length of time as will prepare it for the treatment herein specified.

The Engineers may at any time reject in bulk all timber that does not fulfill the above requirements, and order same removed and properly culled before being returned to the mill.



TREATMENT. The blocks shall be placed in an air-tight cylinder where, by means of steam and the vacuum pump the sap in the blocks will be vaporized and the moisture in them removed. During the process of steaming a vent shall be kept open in the cylinder to permit the escape of water, air and condensed steam in the cylinder. After the heating or steaming period, the drain or vent in the bottom of the cylinder shall be opened and all moisture removed from the cylinder. During the vacuum period the temperature in the cylinder must be above the boiling point of water under existing vacuum.

When the cylinder is thoroughly drained a vacuum of not less than twenty (20) inches (Hg.) shall be maintained.

When the blocks are thoroughly dry the cylinder shall be filled with oil destroying a vacuum of not less than twenty (20) inches (Hg.) and pressure shall then be applied and increased gradually to not more than two hundred (200) pounds per square inch and maintained until .....twenty....(20) pounds of oil have been forced into and retained in each cubic foot of timber and until the oil





has impregnated the blocks to the satisfaction of the Board of Local Improvements. The pressure period on the oil shall be continuous and of a duration of not less than three (3) hours. After the surrounding oil has been removed, the blocks shall remain in the closed cylinder for a period of thirty (30) minutes to allow the excess oil on the surface of the blocks to drain off. The oil thus drained off shall be forced back into the treating tank in order to determine the amount of impregnation. In the process of treating the blocks, a correction must be made for any water contained in the cylinder. Compensation shall also be made for leaks and other wastes of oil, that may occur during treatment.

If, in the treatment of the blocks, more oil is injected per cubic foot of timber than is called for in the specifications, such excess oil must not be removed. The temperature of the oil after entering the cylinder, shall not be lower than one-hundred (and) sixty-five (165) degrees Fahrenheit. The cylinder shall be provided with sufficient steam coils to fully maintain this temperature throughout injection.

The oil tanks and cylinder in which the blocks are



treated shall be equipped with the necessary gauges, thermometers and draw-cocks in order to facilitate a thorough inspection of the materials and treatments. The cylinder shall be equipped with the proper connections and apparatus for artificially seasoning timber before the impregnation with the creosote oil.

The plant shall be provided with proper means for obtaining the absolute measurement and weight of all oils entering the cylinder and the amount of oil absorbed by the blocks.

OIL. 1. The oil shall be a distillate obtained wholly from coal tar.

2. It is required by this specification that the oil used shall be wholly a distillate oil obtained only by distillation from coal tar. No other material, of any kind, shall be mixed with it.

3. The oil shall contain not more than one (1) per cent. of matter insoluble in hot benzol and chloroform.

4. Its specific gravity at twenty-five (25) degrees Centigrade shall be not less than one and eight-hundreths (1.08) and not more than one and twelve-



hundredths (1.12).

5. The oil shall be subject to a distilling test as follows:

The apparatus for distilling the creosote must consist of a stoppered glass retort having a capacity as nearly as can be obtained, of eight(8) ounces upto the bend of the neck, when the bottom of the retort and the mouth of the off-take are in the same plane. The bulb of the thermometer shall be placed one-half (1/2) inch above the liquid in the retort at the beginning of the distillation, and this position must be maintained throughout the operation. The condensing tube shall be attached to the retort by a tight cork joint. The distance between the thermometer and the end of the condensing tube shall be twenty-two (22) inches, and during the process of the distillation the tube may be heated to prevent the congealing of the distillates. The bulb of the retort and at least two(2) inches of the neck must be covered with a shield of heavy asbestos paper during the entire process of distillation, so as to prevent heat radiation, and between the bottom of the retort and the flame of the lamp or burner two (2) sheets of wire



gauze each twenty (20) mesh fine and at least six (6) inches square must be placed. The flame must be protected against air currents.

The distillation shall be continuous and uniform, the heat being applied gradually. It shall be at a rate approximating one (1) drop per second, and shall take from thirty (30) to forty (40) minutes after the first drop of distillate passes into the receiving vessel. The distillates shall be collected in weighed bottles and all percentages determined by weight in comparison with dry oil. When one hundred (100) grams of the oil are placed in the retort and subjected to the above test, the amount of distillate shall not exceed the following: Up to 150 degrees Centigrade, 2 per cent.

Up to 210 degrees Centigrade,  
10 per cent.

Up to 235 degrees Centigrade,  
20 per cent.

Up to 315 degrees Centigrade,  
40 per cent.

The distillation of the oil, shall be carried to three hundred and fifty-five (355) degrees Centigrade. The residue thus obtained when cooled to fifteen degrees (15)





Centigrade shall not be brittle, but shall be of a soft waxylike nature so that it can be readily indented with the finger. When a small portion of this residue is placed on white filter paper and warmed, the oil spot produced, when viewed by transmitted light, shall appear of an amber color.

6. The tar acids of the distillate from two hundred and fifty (250) degrees Centigrade to three hundred and fifteen (315) degrees Centigrade must not be less than six (6) per cent of this distillate (250° to 315°C.)

7. The amount of the unsaponifiable oil ( by sulphuric acid and caustic soda) in the distillate from two hundred and fifty (250) ~~degrees~~ Centigrade to three hundred and fifteen (315) degrees Centigrade must not exceed three and one-half (3 1/2) per cent. of this distillate.

The contractor shall deliver to the Engineers an affidavit from the individual manufacturing the blocks ( if manufactured by an individual), from the managing officer of the corporation manufacturing the blocks ( if manufactured by a corporation) and by an active member of the firm manufacturing the blocks ( if manufactured by



a firm), setting forth that all oil used for treating the blocks for this contract is a distillate oil obtained wholly and entirely by distillation from coal tar and that it is free from any adulteration.

LAYING. The blocks shall be laid in parallel courses across the roadway at an angle of approximately .....Ninety..., (90) degrees from the center line thereof, except at the intersections of all alleys, where they shall be laid at right angles with the center lines thereof. On intersections and junctions of lateral streets, the blocks shall be laid at an angle of forty-five (45) degrees with the line of the street, unless otherwise ordered by the Engineer. The blocks shall be laid with the fiber of the wood running in the direction of the depth. Gutters shall be constructed as directed by the Engineer. The courses shall break joints alternately by a lap of not less than two (2) inches and the blocks shall be driven together except where joints for expansion are constructed as follows: On each side of the roadway a longitudinal joint shall be formed by placing a one one-half ( 1 1/2) inch board on edge against the curb. The blocks shall be firmly laid against said boards.



The boards shall remain in place until the blocks are rolled, and immediately preceding the application of the filler as hereinafter specified, they shall be carefully removed without disturbing the adjacent blocks.

The blocks, when set, shall be rolled with a steam roller weighing not less than five (5) tons, until firmly bedded and brought to a uniformly even surface. After rolling, all imperfect blocks shall be removed and replaced by perfect blocks. Broken blocks shall not be used except to break joints in starting courses and in making closures. If the blocks that have been laid should become wet before the filler is applied, they must be taken up and reset at the contractor's expense, if the Engineer so directs. In no case will teams be allowed on the work before the wearing surface is completed.

**PITCH FILLER.** After rolling, the surface of the pavement shall be cleaned and the joints between the blocks and expansion joints shall be filled with a paving pitch which shall conform to the following requirements:

(a) It must be obtained from coal tar only and there must be no admixture with it of any material not



obtained from coal tar.

(b) Its specific gravity at seventy-seven(77) degrees Fahrenheit(compared with water at that temperature) shall be not less than one and twenty-two hundredths (1.22) nor more than one and thirty-five hundredths(1.35).

(c) It shall contain not less than twenty-two (22) per cent, nor more than thirty-seven (37) per cent. of free carbon, the free carbon being defined as the organic material insoluble in cold carbon disulphide after digesting twelve (12) hours at room temperature.

(d) On heating one hundred grams(100) of the pitch to six hundred (600) degrees Fahrenheit the distillate shall not exceed five (5) per cent. by weight. The distillation shall be conducted in an eight (8) ounce asbestos jacketed retort in which is inserted a three (3) inch immersion thermometer, the bottom of which extends to within one-half ( $1/2$ ) inch of the surface of the pitch when in a fluid state, and the temperature increased at the rate of twenty(20) degrees Fahrenheit per minute until the first drop of distillate is formed and thereafter at approximately the rate of one





(1) drop per second. The total length between the thermometer entering the retort and the end of the adaptor shall be twenty-two (22) inches. Two sheets of wire gauze each twenty (20) mesh fine are placed between the bottom of the retort and the burner.

(e) The melting point of the pitch shall be not less than one hundred and forty-five (145) degrees Fahrenheit and not more than one hundred and fifty-five (155) degrees Fahrenheit when obtained by the following method: Five (5) grams of the pitch are molded by hand into the approximate form of a cube. Through the center of this cube is inserted a Brown & Sharpe gauge bent copper wire (eight -hundredths (.08) of an inch in diameter) from face to face of the cube. The bottom of cube of pitch and the bulb of the thermometer are placed one (1) inch above the bottom of a two hundred and fifty (250) cubic centimeter Griffin form beaker filled with two hundred (200) cubic centimeters of water and kept at a temperature of seventy (70) degrees Fahrenheit for fifteen (15) minutes. The temperature is then raised nine (9) degrees Fahrenheit per minute until the softening pitch which touches the bottom of the vessel or a tin cover or paper ~~ars~~ sand placed



therein to catch the melted pitch. The temperature recorded at the instant the pitch touches the bottom is the melting point of the pitch.

(f) The penetration of the pitch shall be not less than thirty (30) and not more than sixty (60) as determined by the New York Testing Laboratory Penetrometer. The sample shall be placed in water which is maintained at one hundred (100) degrees Fahrenheit for not less than thirty (30) minutes. The penetration shall be taken under water at one hundred (100) degrees Fahrenheit under a weight of fifty (50) grams acting for five (5) seconds.

TOP DRESSING. Immediately after the filling of the joints, the surface of the pavement shall be covered to a depth of one-quarter ( $1/4$ ) inch with screened, hot, torpedo sand.

#### (17) HEADERS.

At the end of each intersecting street and alley wing there shall be placed a "header" extending from curb to curb, and so dressed as to conform to the crown of the pavement. The "header" shall be constructed of three by twelve (3 x 12) inch oak plank, properly supported by six



inch split cedar posts three (3) feet in length, firmly set in the ground and spaced not more than five (5) feet apart. When concrete is used as a foundation the "headers" must be set prior to the laying of the concrete. All "headers" shall be constructed by the contractor and the cost thereof shall be included in the price bid per square yard for the pavement.

(18) CHANGE OF PLANS)

If the Engineers deem it proper or necessary in the execution of the work to make any alteration which will increase or diminish the quantity of labor or material or the expense of the work, such alteration shall not annul or vitiate the contract or agreement hereby entered into, nor release the surety thereon, and the contractor shall furnish the necessary labor and material to complete the contract as altered. The value of the work so added or omitted shall be added to or deducted from the amount otherwise due the contractor, as the case may be, and the determination of such value shall be based on the rates and prices named in the contract, when such rates and prices can be equitably applied, otherwise the value shall be determined by mutual agreement between the Engineer and



the contractor.

(19) EXTRA WORK.

No claim whatever will be allowed the contractor for extra work or material or for a greater amount of money than is herein stipulated to be paid, unless some change in or addition to the work requiring additional outlay by the contractor is first ordered in writing, by the Engineers. Said writing shall state that such work is not included in the contract, what the extras are, and that they are necessary for the proper completion of the work or for the security of the work previously done, and the reasons why such extras are necessary.

(20) CONNECTION OF OPENINGS.

It is hereby understood and agreed that the contractor shall furnish, without extra compensation, all labor and materials necessary to connect and fit the new improvements with all openings on the line thereof in connection with water, sewer, gas, electric conduits, etc., after the same have been brought to the proper grade, and in general everything necessary to render the work fully complete and ready for use.

No deductions will be made in calculating the





final quantities for space occupied by openings above specified, or for any other unpaved space within the limits of the improvement of less than one (1) square yard in area.

(21) STREETS OCCUPIED BY CAR TRACKS.

Where streets are occupied by car tracks and the length of the improvement is more than one-fourth (1/4) mile, the contractor, unless otherwise directed by the Engineers, shall fully complete the improvement on one side of the street in each block before commencing any grading operations on the other side of the roadway in the same block.

(22) USE OF FIRE HYDRANTS.

Contractors desiring to use water from public hydrants shall make application to the proper bureau, and in such cases conform to the rules and regulations of city ordinances and the rules of the department.

(23) PATENTS AND TRADE SECRETS.

All fees for any patented invention, article or arrangement that is used upon or in any manner connected with the construction, erection or maintenance of the work, or any part thereof embraced in the contract and these



specifications, shall be included in the price stipulated in the contract for said work, and the contractor must protect and hold harmless the Engineers against any and all demands for such fees or claims.

It is hereby expressly agreed that alleged ownership by any contractor of trade secrets as to materials used in any part of the work, or the preparation of any mixture of such work, shall not be recognized by the Engineers in the performance of this contract. The Engineers shall at all times have the right to demand and shall be furnished information concerning materials or samples of ingredients of any materials used or proposed to be used in the preparation of the pavement to be laid, nor shall mixtures once agreed upon be changed in any manner without the knowledge and consent of the Engineers.

#### (24) DAMAGES AND OBSTRUCTIONS

All loss or damage arising out of the nature of the work to be done, or from any detention or other unforeseen or unusual obstruction, or from difficulties which may be encountered in the prosecution of the work, or from the action of the elements, shall be sustained by the contractor.



The contractor shall remove at his expense all obstructions, such as stone, old pavements, debris, trees, etc., that may be in the way of making the improvement.

The contractor shall remove all surplus materials and debris from the streets as the work progresses, so that the public may have the use of the improvement as soon and as fast as completed.

The contractor will be held responsible for any damage to the water, gas or drain pipes, sidewalks, conduits, etc., in addition to the penalty prescribed by ordinance.

If, in the prosecution of the work, it is necessary to dig up, use or occupy any street, alley, highway or public grounds of the City of Chicago, the contractor shall erect and maintain strong and suitable barriers and during the night time, such lights as will effectually prevent any accident or harm to life, limb or property in consequence of such digging up, use or occupancy of said street, alley, highway or public grounds; and the contractor shall be liable for all damages occasioned by or resulting from the digging up, use or occupancy of said street, alley, highway or public grounds.



The contractor shall post notices at each street intersection along the line of the work warning all persons against trespassing on the same, removing barriers, lights, etc; and calling attention to the sections of the Municipal Code of the City of Chicago , pertaining thereto.

During the progress of the improvement the contractor shall not obstruct any railway along the line thereof, or in any way prevent it from being used in its customary manner. The contractor will be held liable for all damages resulting from any failure to comply with this stipulation.

The cost of removing obstructions and removing, repairing and replacing sidewalks, erecting barricades, posting notices, etc; etc; shall be included in the unit prices bid for the various parts of the improvement.

(25) DIRECTION AND SUPERINTENDENCE.

The contractor shall perform all of the work herein specified under the direction and superintendence of Engineers and to its entire satisfaction, approval and acceptance.

All materials to be incorporated in the work, all labor performed, and all appliances, tools and methods used shall be subject to the inspection and approval or rejection





of the Engineers.

The Engineers shall decide all questions relating to measurements, the materials used, the character of the work performed, and as to whether the rate of progress is such as to comply with these specifications.

If any authorized agent of the Engineers shall point out to the contractor any neglect or disregard of the specifications, such defects shall at once be remedied and further defective work be at once discontinued; but the right of final acceptance or condemnation of the work will not be waived by reason thereof, nor by any other act of the agents.

If at any time during the progress of the work any material is rejected, or if any of the work is wholly or in part improperly constructed, then the contractor, at his expense, shall immediately remove all rejected material and shall reconstruct all work improperly done.

The Engineers shall have the authority to order the dismissal of any employee on the work who refuses or neglects to obey any of their instructions relating to the carrying out of the provisions and intent of these specifications, or who is incompetent, unfaithful, abusive,



.threatening or disorderly in his conduct and such person shall not be again employed on the work.

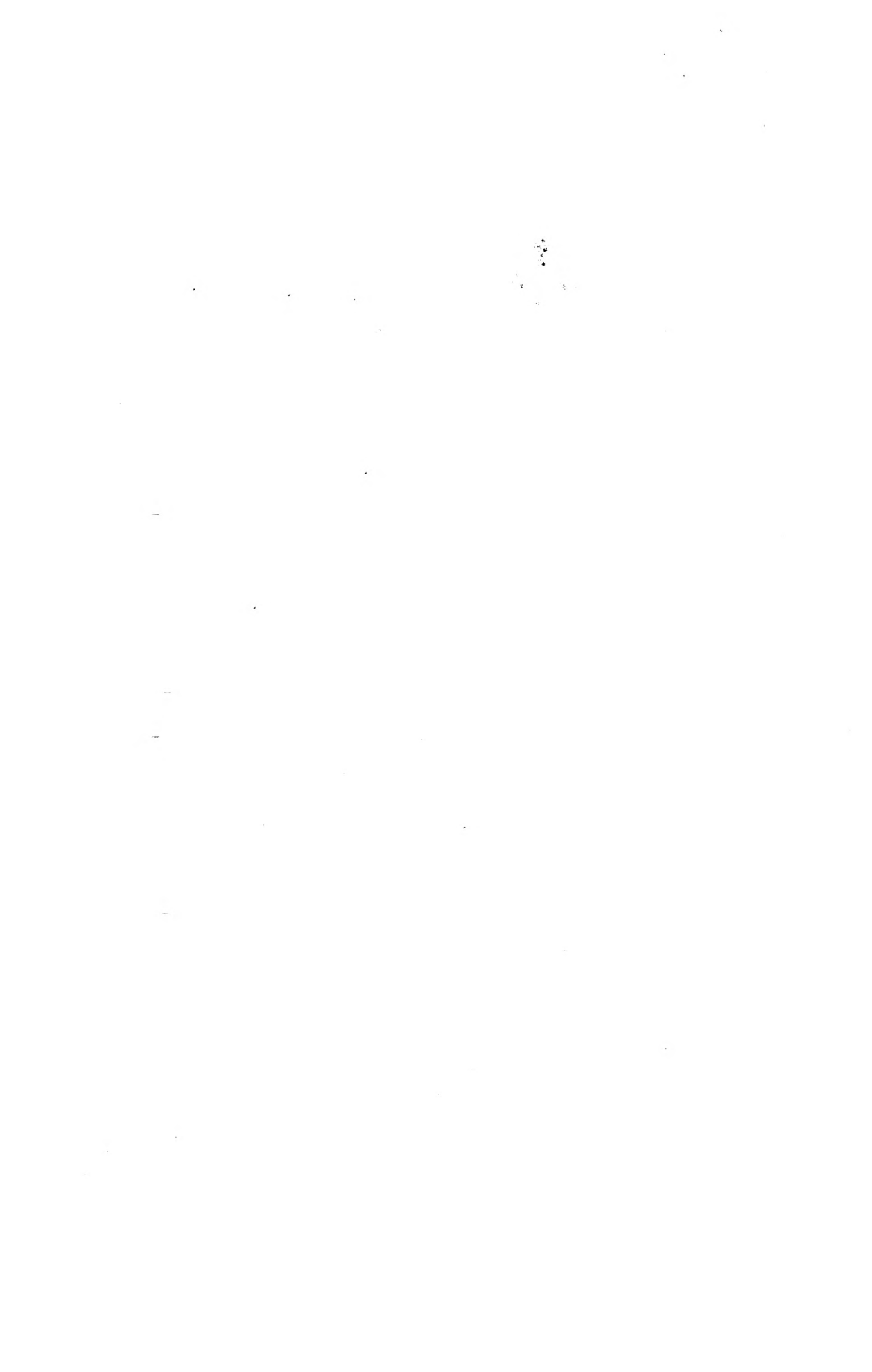
All work at the plant and upon streets under this contract must be conducted during regular working hours unless special permit is granted by the Engineers to conduct the work at other periods.

The contractor shall furnish stakes and assistance necessary to give lines and grades where needed for the work as directed by the Engineer in charge.

The contractor shall notify the Engineers forty-eight (48) hours before beginning any work on this contract of his intention to do so, and in case of a temporary suspension of the work he shall give a similar notice before resuming work.

The contractor shall make an application , in writing, to the Engineers and obtain their written permission before beginning any work on this contract; said application shall state that all arrangements have been completed for securing promptly all materials, apparatus and labor to prosecute the work continuously and without needless delay or annoyance to the public.

The contractor shall furnish all necessary



facilities, should it be deemed advisable by the Engineers to make an examination of any work already completed. If the work is found defective in any respect the contractor shall defray the expense of such examination and of satisfactory reconstruction. If the work is perfect, such expense will be allowed for by the Engineers.

The Engineers shall at all times have access for inspection to all branches of the work on the street, at the refineries, or at the plants where material is stored, prepared or being mixed; and the contractor shall furnish from time to time such samples of each separate ingredient or ingredients in combination of the materials to be used in the improvement as may be requested by the Engineers.

When deemed necessary by the Engineers, the contractor shall store separately and in such manner as to admit of identification any or all materials which he proposes to incorporate in this improvement.

(26) CONTRACTOR'S DEFAULT- FORFEITURE OF CONTRACT.

The work herein specified shall be prosecuted with such force as the Engineers may deem adequate to its completion within the time specified. If the rate at which the work is performed is not, in the judgment of the Engineers,



such as to, insure its progress and completion in the time and manner herein specified, or if at any time the contractor refuses or neglects to prosecute the work with a force sufficient, in the opinion of the Engineers, for its completion within the specified time, or if, in any event, the contractor fails to proceed with the work in accordance with the requirements and conditions of these specifications, the Engineers shall have full right and authority to take the work out of the hands of the contractor and to employ other workmen to complete the unfinished work, or to relet the same to other contractors, and to deduct the expense occasioned by such default from any money that may be due and owing to the contractor.

. If the work shall be wholly or in part improperly constructed, the Engineers shall have the right to order the entire reconstruction of the same, and in case the contractor shall default or refuse to reconstruct any work improperly done, declare the contract for said work forfeited either as to a portion or the whole and to relet the same. In the event of such default or, forfeiture the Engineers shall have the right to adjust the difference of damage or price (if there be any) which, according to





a just and reasonable interpretation of these specifications and the contract as a whole, the contractor should pay to the Engineers, as damages for failure to properly commence and prosecute or to properly construct said work in all respects according to the conditions hereinbefore specified, or for any other default; and it is hereby understood and agreed that for the amount of damage or price determined by the Engineers to be paid to them by the contractor for any such default, or for any money paid out by them, on account of the contractor, in consequence of any such default, there shall be applied in payment thereof a like amount of any money that may be due and owing to the contractor on account of said work, so far as there may be any such money, and so far as the same shall be sufficient; and if there shall not be a sufficient amount retained from said contractor, then and in such case the amount to be paid to the Engineers in consequence of such default shall be a just claim against the contractor and be recovered from him at law, in the name of the Engineers, before any court of competent jurisdiction, either by suit upon his bond or otherwise.

In case the Engineers deem it necessary to declare



any portion or section of the work forfeited, it is expressly stipulated and understood that such declaration of forfeiture shall not in any manner relieve the contractor from the covenants and conditions of the contract for said work, but the same shall remain valid and binding on said contractor.

In case the contractor abandons or in any manner fails to complete the work within the time herein specified, the Engineers are hereby authorized and empowered to pay any laborer who has been employed by the contractor upon the said work the amount due such laborer out of any funds due the contractor, without giving any notice whatever to the contractor, of their intention to do so. In every such case, the Engineers are hereby authorized and empowered to ascertain in such a manner and upon such proofs as he may deem sufficient the amount due any such laborer from the contractor, without giving any notice of such proceeding to the contractor. The amount so found to be due such laborer shall be final and conclusive as against the contractor and may thereafter be paid over by said Engineers to, such laborer.



## (27) ASSIGNMENT PROHIBITED.

No part of the work herein specified shall be assigned without the written consent of the Engineers and in no case shall such consent relieve the contractor or his surety from the obligations herein entered into by the same or change the terms of this agreement.

## (28) TIME FOR COMPLETION OF WORK.

The work to be performed under these specifications shall be completed on or before.....  
 ..... and the time specified for completion of the work is an essential condition of the contract. In case the contractor fails to complete the work at the time specified he shall pay to the Engineers as assessed, agreed and liquidated damages the sum of twenty-five (25) dollars per day for each day and every day that elapses after the date specified for completion of same, until the work is actually completed in accordance with these specifications, and such amount shall be deducted from any money that may be due and owing to the contractor; provided, however, that if the contractor is delayed by any act of the Engineers in the prosecution of the work, or in case the work is suspended by order of the Engineer, then



the time of such delay or suspension shall be added to the time for the completion of the contract.

(29) GUARANTEE.

It is hereby understood and agreed that the material furnished and used and the workmanship employed in the construction of said improvement shall be of such quality and character as to insure the said improvement to be free from all defects and to remain in continuous good order and condition, satisfactory to the Engineers, for a period of .....five...(5) years from and after the acceptance of the work by the Engineers, provided such work shall be approved by the court where such approval is required by law. The keeping and maintaining of said improvement in continuous good order and condition for the above mentioned period shall include all repairs to be made, or if necessary the entire reconstruction of the work as said Engineers may direct, without any additional charge or cost to the Engineers, except as hereinafter provided.

If, at any time during the period of the guarantee, the surface of the pavement has an excess of pitch or oil due to the "bleeding" of the blocks, the contractor, shall without additional cost to the Engineers, within three days





after notice from the Engineers, remove such excess or top-dress the pavement with dry torpedo sand.

The contractor shall deposit with the Engineers a sum in cash equal to five (5) per cent. of the total price of said improvement, or the Engineers may retain such sum out of the price to be paid for such improvement; and the contractor hereby stipulates and agrees with the Engineers that said sum of money so deposited or so retained shall be disposed of or repaid to him, under the following terms and conditions, to-wit:

The contractor shall as often as may become necessary repair or replace all or any part of said improvement and shall commence work on any repairs or replacement that may be ordered by the Engineers within ten (10) days after they shall have mailed notice so to do to the contractor at the last known address of said contractor, and shall complete said work without delay; provided, however, that except in cases of public urgency the Engineers shall not require repairs or replacements to be made during the months of December, January, February and March.

The contractor shall notify the Engineers, at



least two(2) days before beginning any repairs or replacements of said improvement, of the location of and the time of doing such work.

If the contractor at any times fails to promptly repair or replace any improvement whenever or wherever necessary or directed so to do by the Engineers, as hereinbefore provided, he shall then and there be in default; and in order to properly and satisfactorily maintain said improvement in case of such default, the Engineers are authorized without further notice to the contractor, to employ any other persons, firms or corporations to furnish all such material and labor as may be found necessary by said Engineers to properly repair and replace said improvement. And in order to defray any and all expenses incurred by the Engineers in repairing or replacing and maintaining said improvement, the Engineers may apply thereto any and all sums of money which may at any time be on deposit or held in reserve by or for said contractor.

And it is expressly agreed that any payments agreed to be made by the Engineers for any repairs or replacements to any improvement shall be construed as a payment made to the contractor, and the special assessment



warrant and the Engineers shall thereby be released and discharged from any and all claims or obligations to the extent of any such payment for repairs or replacements, the same as though such payment were made to the contractor.

If the contractor is not in default in any way in connection with any improvement under contract between said contractor and the Engineers, and if all such improvements are in good order and condition satisfactory to the Engineers, they shall repay to the contractor the sum of money deposited or held in reserve in connection with this contract, or so much thereof as has not been agreed to be paid or expended by the Engineers for repairing or replacing any improvement, in the manner following, to-wit:

At the end of the first year of said maintenance period, a sum equal to one-fifth (1-5) of the amount held on deposit or reserve on this improvement;

At the end of the second year one-fifth(1/5) of the amount

At the end of the third year one-fifth(1/5).

At the end of the fourth year one-fifth(1/5); and

At the end of the fifth year the remainder of



the amount held on deposit or reserve on this improvement .

Interest shall not be payable upon the moneys so retained, unless the assessment is collectible with interest. If interest is payable, it shall be at the same rate of interest as may be collected by the City of Chicago on such amount out of the assessment.

And it is expressly agreed that if any time within the maintenance period said improvement shall be disturbed by cutting or otherwise for any purpose by any party having obtained a permit therefor from the City of Chicago, the contractor shall replace said improvement in strict compliance with these specifications, and in such proper and workmanlike manner as will leave the whole improvement in as good, serviceable and durable a condition as it was before being disturbed. All of said work shall be subject to the inspection and approval of the Engineers, and shall be under the direction of the Engineers, and such repairs or replacements so made shall, however, not constitute a waiver of the original guarantee hereinabove set forth and that such guarantee shall extend for and during the original





period of guarantee as to such replaced work.

The contractor shall be paid by the Engineers for such repairs and replacements at the following rates , to-wit:

1. The minimum compensation for any single repair or replacement of said improvement shall be ten (\$10.00) dollars;

2. For any repair or replacement of said improvement of an area of less than twenty-five (25) square yards the rate shall be four (\$4.00) dollars per square yard.

3. For any repair or replacement of an area of twenty-five (25) square yards or more, the rate shall be three dollars and fifty cents, (\$3.50) per square yard.

Provided, however, that if the repairing or replacing of said improvement does not include the concrete foundation, then the aforesaid rates of compensation shall be reduced as follows, to-wit:

1. The minimum compensation for any single repair or replacement of said improvement shall be six (\$6.00) dollars;

2. For any repair or replacement of said improve-



ment of an area of less than twenty-five (25) square yards the rate shall be three dollars and thirty cents (\$3.30) per square yard;

3. For any repair or replacement of an area of twenty-five (25) square yards or more the rate shall be two-dollars and eighty cents (\$2.80) per square yard.

The unit prices per square yard are to apply to pavements where the depth of the block is four (4) inches. Where the depth of the block is three and one-half ( $3 \frac{1}{2}$ ) inches, they shall be respectively reduced twenty (20) cents per square yard. If the depth of the block is three (3) inches, they shall be respectively reduced forty (40) cents per square yard.

#### (30) MANNER OF PAYMENT.

If the rate of progress is satisfactory to the Engineers, and it appears that all claims for labor and materials are satisfied, vouchers will be issued to the contractor during the progress of the improvement for eighty-five (85) per cent. of the value of the work done and in place at the time of issuing such vouchers; and upon the final completion and acceptance of the work by the Engineers or upon its approval by the Court, vouchers



will be issued for the remainder less the sum retained as hereinbefore specified; provided, however, that no partial voucher will be issued until at least fifteen (15) per cent of the work contracted for is done and in place, and then only for a net sum of one thousand (\$1000.00) dollars or more.

(31) SWORN STATEMENT REQUIRED

No voucher in final payment will be issued until the contractor delivers to the Engineers a statement in writing, setting out fully the amount, kind and quality of the several materials used and incorporated into the work herein required to be done; said statement to be sworn to by the contractor before a Notary Public or other officer authorized to administer oaths. It is further agreed that the Engineers shall have a reasonable time in which to verify the accuracy of such sworn statement before such voucher in final payment is issued.

(32) CONTRACTOR'S CERTIFICATE.

The undersigned, the contractor, hereby certifies that he has read the foregoing specifications, and that his proposal for the work is based on the conditions and re-



quirements embodied therein; and should the contract be awarded to him, he agrees to execute the work in strict accordance therewith.

Name..... Address.....

Name..... Address.....

Name..... Address.....





**SPECIFICATIONS**  
**for**  
**SHEET ASPHALT PAVEMENTS.**



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#### (1) INSTRUCTIONS TO BIDDERS.

The contract of which these specifications are a part is drawn under an ordinance which was heretofore



passed by the City Council of the City of Chicago, providing for the said improvement, and it is understood that the Contractor shall carefully examine the said ordinance, as, under the laws of the State of Illinois, the Improvement, as completed, must comply with the terms and provisions of the ordinance providing for the said Improvement.

It is the intention of these specifications to provide for this improvement in a complete, thorough and workmanlike manner. The contractor to whom the work is awarded shall furnish all materials, labor and appurtenances necessary to complete the work in accordance with these specifications, and anything omitted herein that may be reasonably interpreted as necessary to such completion, the Engineers, being the Judge, are to be merged in the prices bid for the improvement.

No bid will be accepted which does not contain an adequate or reasonable price for each and every item named in the schedule of quantities.

Bidders must satisfy themselves, by personal examination of the location of the proposed work, and by such other means as they may prefer, as to the accuracy of the



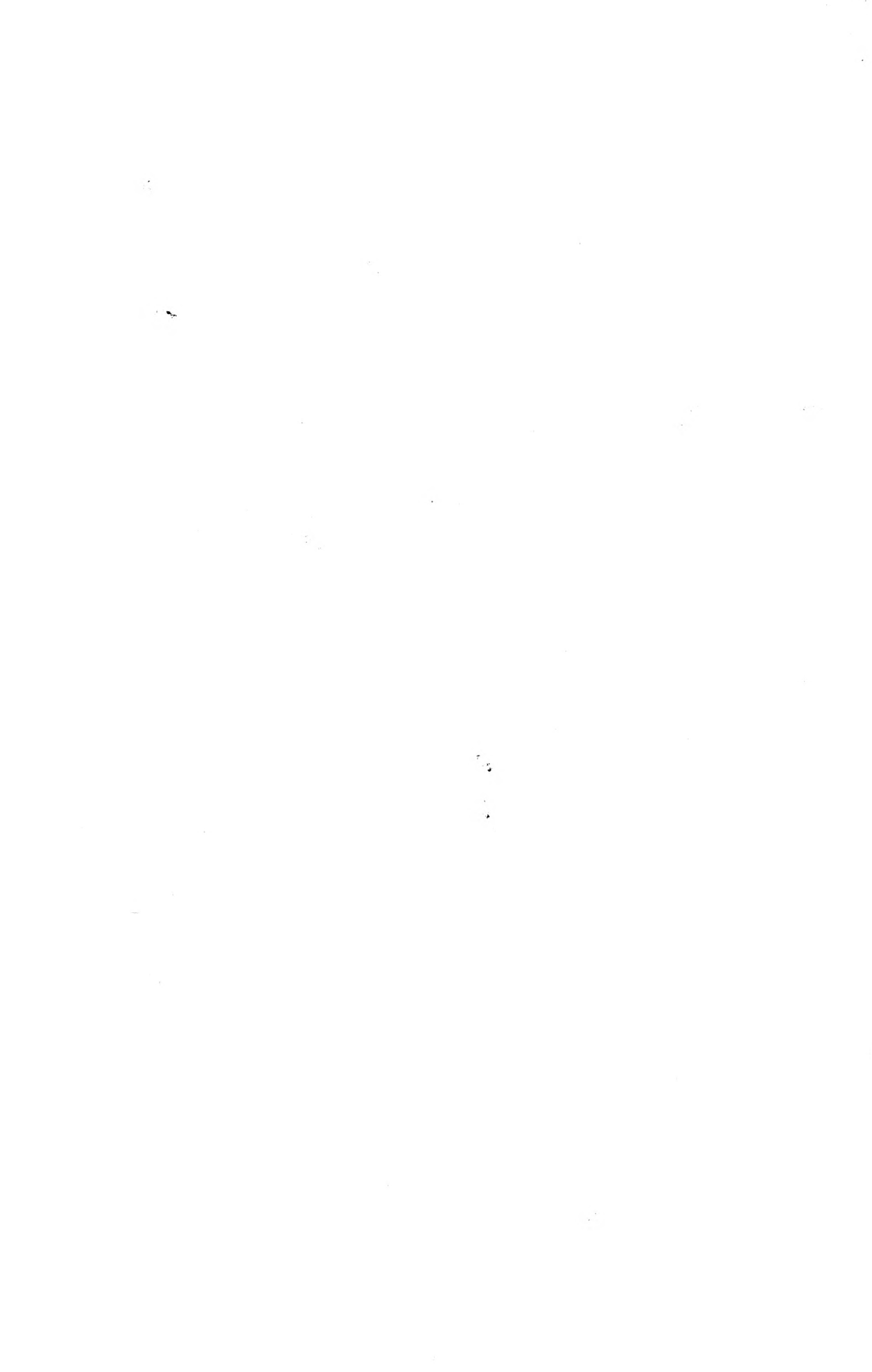


estimates of quantities and shall not at any time after the submission of their proposals dispute or complain of such estimates of the Engineer nor assert that there was any misunderstanding in regard to the nature or amount of the work to be done.

Bidders must state in their proposals the name and the source of the supply of the asphalt they propose to use; also the name and source of fluxing or softening material, to be used with said asphalt, and the relative proportions of each. Samples of both the asphalt and fluxing or softening material shall be furnished, when required, to the Engineers by the bidder before award of contract is made.

Bidders must present satisfactory evidence that they have been regularly engaged in the business of laying asphalt pavements, or are reasonably familiar therewith, and that they are fully prepared with the necessary capital, materials and machinery to conduct the work to be contracted for to the satisfaction of the Engineers.

Where combinations of different asphalts are proposed to be used the bidder must furnish in writing the names of the respective kinds and the brands of oils or



other softening agencies.

All bids must be made subject to the rights of the owners of a majority of the frontage, to contract for the improvement as provided for in Sections 80 and 81 of an Act of the General Assembly of the State of Illinois, Entitled, "An Act Concerning Local Improvements," approved June 14, 1897; in force July 1, 1897; and the amendments thereto.

Bidders are especially notified that in the event of any disputes relating to chemical analysis or ingredients of paving materials or other physical qualities, all tests must be based upon the defined official methods approved by and on file in the office of the Board of Local Improvements.

No bids will be accepted from any persons or firms who may be in arrears to the City of Chicago upon debt or contract, or who may be in default, as surety or otherwise, upon any obligation to said City of Chicago, or behind specified time on any previous work. Companies or firms bidding for the work herein described must state in the proposals the individual names and places or residence of the officers or persons comprising such company or firm.



The Engineers in charge expressly reserve the right to reject any or all bids or to accept bids separately as to any or all items in the schedule of quantities, or to accept any bid in the aggregate.

(2) DEFINITIONS.

Wherever the words " Engineers " occur in these specifications they shall be interpreted to mean "Engineers in Charge " and of their authorized representatives; provided, however, that such persons shall be understood to represent said Engineers only to the extent of the special duties imposed upon them.

Wherever the word " Contractor " occurs in these specifications it shall be interpreted to mean the person or persons to whom the work herein specified is awarded and the agents, employes, workmen, or assignees, thereof.

Whenever the word "work" occurs in these specifications, it shall be interpreted to mean the work including all material, labor and use of tools necessary to complete the improvement in full compliance with the terms of these specifications.



Wherever the word "rock" occurs in these specifications it shall be interpreted to mean any material geologically in place and of a hardness when first exposed of three or greater in the scale of mineral hardness, which corresponds to the hardness of the transparent variety of calcite. Other material shall not be classed as rock, although it may be more economical to remove the same by blasting.

Wherever the word "penetration" occurs in these specifications, without special qualification, it shall be interpreted to mean the degree of penetration recorded by the Dow penetration machine in the asphalt laboratory of the Engineers, fitted with a No. 2 needle weighted with one hundred (100) grams acting for five (5) seconds on the material at a temperature of seventy-seven (77) degrees Fahrenheit .

Wherever the word " ductility" occurs in these specifications, it shall be interpreted to mean that a briquette of the material, Dow form, having a cross-section of one (1) centimeter per second and elongated at the rate of one (1) centimeter per second, at a temperature of seventy-seven (77) degrees Fahrenheit, shall stretch,





measured by the Dow method, to the distance stated before breaking. .

Wherever the words "specific gravity" occur in these specifications they shall be interpreted to mean the weight of a definite volume of the substance at the temperature stated compared with the weight of the same volume of distilled water at the same temperature.

Wherever the word " bitumen" occurs in these specifications, it should be interpreted to mean the organic material soluble in carbon disulphide.

(11) CONCRETE COMBINED CURB AND GUTTER.

A concrete combined curb and gutter shall be constructed at the established grade and in a continuous line on each side of the street .fifteen...(15)... feet from and parallel with the center line thereof, except at all intersections of streets and alleys, where it shall be returned to the property line, and at such intersections, there shall be formed the necessary circular stones built to such a radius as the Engineer may direct. All grades and lines will be given by the Engineer. The combined curb and gutter shall rest on a foundation of cinders or sand, which must be ...six(6).



inches in thickness after being thoroughly flooded and compactly rammed to an even surface.

The curb and gutter shall be made of concrete formed by intimately mixing one (1) part of Portland Cement with two (2) parts of finely crushed granite or trap rock; to this mixture shall be added four (4) parts of broken granite or trap rock, and the whole thoroughly mixed together. Sufficient water to wet the mass shall then be added and the whole thoroughly mixed. The mixture shall be placed immediately in forms and rammed until a film of moisture appears on top. The forms shall remain in place at least forty-eight (48) hours after the mixture is placed therein.

The gutter flag shall be .seventeen.(17) inches wide and .nine.and.one.half.(9 1/2) inches thick. The curb shall be seven (7) inches thick throughout, except at the upper face corner, which must be rounded to a radius of one and one-half (1 1/2) inches. The height of the curb above the gutter flags shall be of varying dimensions, averaging approximately .three.to.twelve.(3-12) inches.

The exposed surface of the gutter glag shall be covered with a finishing coat one (1) inch in thickness, and the exposed surface of the curb shall be covered with



a finishing coat one and one-half ( $1\frac{1}{2}$ ) inch in thickness. The finishing coats shall be a mortar composed of one (1) part of Portland cement thoroughly mixed with one and one-half ( $1\frac{1}{2}$ ) parts of finely crushed granite or trap rock. Before the concrete sets, the curb and gutter shall be cut into sections not exceeding six (6) feet in length.

The contractor shall furnish and set in the circular stones galvanized iron or steel curb protectors. These protectors shall be the full length of the circular stone, and shall be of such size and shape and so anchored in the body of the curbing as may be approved by the Engineers.

Where the Engineer has directed that cross-walks be formed in the pavement, the contractor shall build, without extra charge, steps in monolithic connection with the gutter flags, in such a manner as to form a gutter nine (9) inches in clear width adjacent to the curb. The additional width of gutter will be measured and paid for as pavement.

The contractor shall build without extra charge all "inlets" necessary to, properly connect the combined



curb and gutter with the catch-basins, and such steps on the gutter flags at the crossing, as the Engineer may direct.

The broken granite or trap rock shall be clean, free from dust, loam and dirt, crusher-run and of varying sizes which will pass through a ring of one and one-half (  $1 \frac{1}{2}$  ) inches internal diameter and be held on a ring of one-quarter (  $\frac{1}{4}$  ) inch internal diameter.

The finely crushed granite or trap rock shall be clean, dry and free from loam and dirt.

The barrows or appliances used in measuring the parts of cement, etc., shall be of such size and shape as may be approved by the Engineers.

The curb and gutter shall be back-filled to the top, and filling at that point shall be level and four (4) feet wide and then shall have a slope of one and one-half (  $1 \frac{1}{2}$  ) horizontal to one (1) vertical.

The price bid per lineal foot for concrete combined curb and gutter must include all cost of grading, inlets, "steps", and metal protectors for circular corner stones, and the cost of removing the old curbing and paving where the roadway has been narrowed.





(12) CONCRETE CURBING IN ALLEYS.

Concrete curbs shall be constructed on each side of the alley in such a manner that the top thereof will conform to the grade of the alley and the roadway face thereof will be ...eight...(8).... feet from and parallel to the center line of the roadway of the alley.

The curbs shall be constructed of the same material as that hereinafter specified, for the concrete foundation, and shall be built at the same time and in connection with the said foundation so that the whole will form a monolithic mass. The top of the curbs shall be covered with a thin coat of mortar and troweled or broomed.

The curbs shall be eight (8) inches in width and .twenty-four...(24..) inches in depth.

(13) CONCRETE FOUNDATION.

On the sub-grade as above prepared shall be laid a foundation of Portland cement concrete to a uniform thickness of six (6) inches. The concrete shall be made of Portland cement and sand or limestone screenings in combination with stone, slag or gravel.

The sand used in making the concrete shall be of sizes ranging from one-quarter ( $1/4$ ) inch down to, the finest,



and shall be free from dirt, dust and other impurities.

No wind-drifted sand shall be used.

The limestone screenings used in making the concrete shall be of varying sizes ranging from one-quarter ( $1/4$ ) inch down to, the finest, and shall be free from dirt, dust and other impurities. The screenings shall be made of the best quality of limestone; screenings made from quarry strippings or stone containing bituminous material will not be accepted.

The stone, slag or gravel used in making the concrete shall be of the best quality of each of the respective materials to be used, clean, free from dust, and shall be of varying sizes. The maximum dimension of any piece of such stone, slag or gravel shall not exceed two (2) inches nor shall the minimum be less than one-half ( $1/2$ ) inch.

The concrete shall be mixed by approved batch machine mixers or on movable, tight, iron platforms of such size as to accommodate the manipulations herein specified. The cement, sand or limestone screenings and stone, slag or gravel, shall be mixed in the following proportions by volume: One (1) part of cement, three (3) parts of sand or



limestone screenings and six (6) parts of stone, slag or gravel. The sand or limestone screenings and cement shall be thoroughly mixed dry, after which water shall be added and the mixture made into a stiff mortar. The stone, slag or gravel shall be immediately incorporated in the mortar and the mass thoroughly mixed, water being added if necessary as the mixing progresses, until each particle of stone, slag or gravel is covered with mortar.

The barrows or appliances used in measuring the parts of cement, sand, limestone, screenings, stone, slag or gravel shall be of such size and shape as may be approved by the Board of Local Improvements.

The sand, limestone screenings, stone, slag or gravel, when delivered on the street, shall be kept clean until used.

The concrete shall be deposited in a layer on the sub-grade in such quantities that, after being thoroughly rammed in place, it will be of the required thickness and the upper surface will be true and uniform and three and one-half (3 1/2) inches below and parallel with the surface of the finished pavement. "Slushing" will not be permitted.



In hot weather the concrete shall be kept moist so as to prevent checking. It shall be protected from injury and shall lie at least seven (7) days before being covered with the binder, or a longer time if deemed necessary by the Engineers.

(16) REFINED ASPHALT.

The refined asphalt to be used for paving mixtures shall be derived in the following manner:

1. By heating , if requiring refining, crude, native, solid asphalt to a temperature of not over four hundred and fifty (450) degrees Fahrenheit until all water and light oils have been driven off. Crude, native, solid asphalt shall be construed to mean any native mineral bitumen, either pure or mixed with foreign matter, having a consistency harder than one hundred (100) degrees penetration. At least ninety-eight and one-half (98 1/2) per cent. of the contained bitumen in the refined asphalt which is soluble in cold carbon disulphide shall be soluble in cold carbon tetra chloride.

2. By the careful distillation of petroleum with steam agitation, at a temperature not exceeding seven hundred (700) degrees Fahrenheit, until the resulting resi-





due has a consistency not harder than thirty (30) degrees penetration.

(a) The solid residue so obtained shall be soluble in carbon tetra chloride to the extent of ninety-eight and one-half ( $98 \frac{1}{2}$ ) per cent.

(b) If the solubility in carbon tetra chloride of the solid residue is less than ninety-nine (99) per cent. , the bitumen shall yield upon ignition not more than fifteen (15) per cent. of fixed carbon; if the solubility is ninety-nine (99) per cent. or more, the bitumen shall yield upon ignition not more than eighteen (18) per cent. of fixed carbon.

(c) When twenty (20) grams of the material are heated for five (5) hours at a temperature of three hundred and twenty-five (325) degrees Fahrenheit in a tin box two and one-quarter ( $2 \frac{1}{4}$ ) inches in diameter, after the manner officially prescribed, it shall lose not over five (5) per cent. by weight nor shall the penetration after such heating be less than one-half the original penetration.

(d) When the refined asphalt is brought to a penetration of fifty (50) by the use of the flux with which



it is to be combined in making the asphaltic cement, or by heating at a temperature below five hundred (500) degrees Fahrenheit, it shall have a ductility of not less than thirty (30) centimeters.

(e) All shipments of material shall be marked with a lot number and penetration, and ten (10) samples taken at random from each lot shall not vary more than fifteen (15) per cent. from the average penetration.

(3) By combining crude, native, solid asphalt with asphaltic or semi-asphaltic flux of the character hereinafter designated, provided that the proportion of the flux to the contained bitumen of the crude asphalt does not exceed forty (40) per cent by weight, or result in a refined asphalt having a penetration greater than forty (40) degrees.

In the use of combinations of refined asphalts for asphaltic cements, only asphaltic or semi-asphaltic fluxes shall be used, except in those cases where the solid natural asphalt is of such character that when mixed with paraffine flux without the addition of any other material it will produce an asphaltic cement complying with the requirements set forth under that head. In such case any



of the fluxes elsewhere specified may be used.

The preparation and refining of all asphalts admitted under these specifications shall be subject to such inspection at the pavingplants and refineries as the Engineers may direct; and where no such inspection is made satisfactory assurance must be presented to the Engineers that the proper materials and methods have been employed in preparing the refined asphalts.

(17) FLUX.

The flux material may be a paraffine, an asphaltic or a semi-asphaltic residuum which shall be tested with and found suitable to the asphalt to be used and must have a penetration greater than three hundred (300) degrees with a No. 2 needle at seventy-seven (77) degrees Fahrenheit under fifty (50) grams weight applied for one second. All residuums shall be soluble in cold carbon tetra chloride to the extent of ninety-nine (99) per cent.

(a) The paraffine residuum shall have a specific gravity of ninety-two hundredths (0.92) to ninety-four hundredths (0.94) at seventy-seven (77) degrees Fahrenheit. It shall not flash below three hundred and fifty (350) degrees Fahrenheit when tested in a New York State Closed



Oil Tester, and shall not volatilize more than five (5) per cent. of material when twenty (20) grams are heated five (5) hours at three hundred and twenty-five (325) degrees Fahrenheit in a tin box two and one quarter (2 1/4) inches in diameter as officially described.

(b) The semi-asphaltic residuum shall have the same general characteristics as paraffine residuum, except that it shall have a specific gravity of ninety-four hundredths (0.94) to ninety-eight hundredths (0.98) at seventy-seven (77) degrees Fahrenheit. It shall have a viscosity coefficient at two hundred and twelve (212) degrees Fahrenheit, of less than sixteen (16) Engler viscosimeter.

(c) The asphaltic residuum shall have the same general characteristics as paraffine residuum except that the specific gravity shall be not less than ninety-eight hundredths (0.98) nor more than one and four-hundredths (1.04) at seventy seven (77) degrees Fahrenheit. The asphaltic residuum after evaporation at five hundred (500) degrees Fahrenheit to a solid of fifty (50) to sixty (60) penetration shall have a ductility of not less than thirty (30) centimeters. \_\_\_\_





(18) ASPHALTIC CEMENT.

The asphaltic cement shall be prepared from the refined asphalt or asphalts and flux, where flux must be used, above designated, provided that mixtures of the refined asphalts, if used, shall be equal parts of each, and that the total proportion of refined asphalt or asphalts comprising the asphaltic cement shall be not less than fifty (50) per cent. by weight.

When the weight of flux in the asphaltic cement prepared from solid, native asphalts exceeds twenty-five (25) per cent. thereof, asphaltic or semi-asphaltic flux shall be used.

The refined asphalt and flux comprising the asphaltic cement shall, when required, be weighed separately in the presence of the Engineers.

The refined asphalt and flux used in preparing the cement shall be melted together in a kettle at temperatures ranging from two hundred and fifty (250) degrees to not over three hundred and seventy-five (375) degrees Fahrenheit, and be thoroughly agitated when hot by air, steam or mechanical appliances, until the resulting cement has become thoroughly mixed into a homogeneous mass. The agita-



tion must be continued during the entire period of preparing the mixtures. The cement shall always be of uniform consistency and if any portion should settle in the kettles between intervals of using the same, it must be thoroughly agitated before being drawn for use.

(a) The asphaltic cement shall have a penetration of from thirty (30) to one-hundred (100) degrees, which shall be varied within these limits to adapt it to the particular asphalt used in the paving mixture and to the traffic and other conditions of the street.

(b) When fifty (50) grams of the asphaltic cement of the consistency used in the paving mixture shall be heated for five (5) hours at a temperature of three hundred and twenty-five (325) degrees Fahrenheit, in a tin box two, and one-quarter ( $2 \frac{1}{4}$ ) inches in diameter, there must not be volatilized more than five (5) per cent of the bitumen nor shall the penetration at seventy seven (77) degrees Fahrenheit after such heating be less than one-half of the original penetration.

(c) A briquette of the asphaltic cement of the consistency used in the paving mixture shall have a ductility of not less than ten (10) centimeters.



## (19) SAND.

The sand shall be hard-grained and moderately sharp. It shall be free from loam or any other foreign material, and shall be so graded as to produce, in the finished surface mixture, the mesh requirements elsewhere herein specified. It shall contain not to exceed six (6) per cent of sand that will pass a 200-mesh sieve.

## (20) BINDER STONE.

The stone or gravel to be used for asphaltic concrete binder shall be hard and durable, free from all foreign substances, and of varying sizes from ...two.... (2) inch downward to one and one fourth ( $1 \frac{1}{4}$ ) inches.

## (21) ASPHALTIC CONCRETE BINDER.

The asphaltic concrete binder shall be prepared as follows:

The binder stone and sand shall be heated to from two hundred (200) degrees to three hundred and twenty five (325) degrees Fahrenheit, measured off separately at the mixer and then mixed with asphaltic cement, in such proportions that the resulting aggregate will contain, by weight, material passing a 10-mesh screen between twenty-five (25) and thirty five (35) per cent. and bitumen in quantity from



five (5) to eight(8) per cent. of the entire mixture. The proportion of asphaltic cement shall at all times be determined by actual weighing with scales attached to the asphaltic cement bucket. The concrete thus prepared shall be a compact mass containing a minimum of voids. With the permission of the Engineers, inlieu of the above, where available, old asphaltic surface paving mixtures may be used in combination with the binder stone, such mixtures having been previously crushed or disintegrated and augmented with fresh asphaltic cement, so that when combined, the resulting concrete, shall form an equally compact mass and correspond as to aggregate passing a 10-mesh screen, and its contained percentages of bitumen with the requirements for the mixture previously specified.

NOTE:- Inasmuch as the percentage of bitumen in the asphaltic concrete binder will depend upon the grading of the aggregate, the proportions of the materials used in the above may be varied by the Engineers, but only within the limits designated.

The asphaltic concrete binder shall be brought to the work in wagons, covered with canvas or other suitable





material, and upon leaving the plant shall have a temperature of two hundred (200) degrees to three hundred and twenty five (325) degrees Fahrenheit. It shall then be placed upon the street and raked to a uniform surface to such depth that, after being rolled and thoroughly compacted, it shall have a thickness of one and one-half (1 1/2) inches . The surface after compression shall show at no place an excess of asphaltic cement, and any spots covering an area of one (1) square foot or more showing an excess of asphaltic cement shall be cut out and replaced with other material. Smaller spots may be dried by the use of stone dust and smoothers. Any asphaltic concrete binder broken up during the process of laying must be removed and replaced with new material.

#### (22) WEARING SURFACE.

The surface mixture shall consist of asphaltic cement ..Portland.Cement. and sand, so proportioned that the mixture will contain average proportions by weight of the whole mixture, as follows:

Bitumen.....	11.0 to 13.5 per cent.
Portland Cement.....	passing a 200 mesh sieve 10.5 to 15.0 per cent.
Sand passing an 80-mesh sieve.....	18.0 to 36.0 per cent.



Sand passing a 40-mesh sieve... ..20.0 to50.0 per cent.

Sand passing a 10-mesh sieve..... 8.0 to25.0 per cent.

Sand passing a 4 mesh sieve..... .0 to10.0 per cent.

Sieves to be used in the order named.

The item designated as " Portland.Cement..... passing a 200-mesh sieve " within the limits named herein includes in addition to the Portland.Cement., fine sand passing a 200-mesh sieve not exceeding four and one-half ( 4 1/2 ) per cent. of the total mixture, and such 200-mesh mineral dust naturally self-contained in the refined asphalt.

The item designated as "Sand passing an 80-mesh sieve " within the limits named herein includes, in addition to sand passing an 80-mesh sieve, the 80-mesh material contained in the Portland.Cement.... and such 80-mesh material naturally self-contained in the refined asphalt.

The sand and the asphaltic cement shall be heated separately to about three hundred (300) degrees Fahrenheit. The maximum temperature of the sand at the mixer shall not be in excess of three hundred and seventy five (375) degrees Fahrenheit, and the maximum temperature of the as-



phaltic cement shall not exceed three hundred and thirty five (335) degrees Fahrenheit at the discharge pipe. The Portland..Cement....shall be mixed with the hot sand in the required proportions, and then these shall be mixed for at least one minute with the asphaltic cement at the required temperature and in the proper proportions in a suitable apparatus so as to effect a thoroughly homogeneous mixture.

The proportion of asphaltic cement shall at all times be determined by actual weighing with scales attached to the asphaltic cement bucket.

The Portland.Cement.... and sand must also be weighed unless a method of gauging approved by the Board of Local Improvements is used.

If the Board of Local Improvements directs, the proportions of the materials in the surface mixture shall be changed, within the above limits, for any part or parts of this improvement.

The contractor shall furnish every facility for the verification of all scales or measures.

The surface mixture shall be hauled to the work in wagons provided with a canvas or other suitable cover. It



shall leave the plant at a temperature between two hundred and fifty (250) degrees and three hundred and thirty-five (335) degrees Fahrenheit, as suitable for the asphalt used. Upon the arrival at the street it shall be dumped at such distance from the work that all of the mixture must be turned and distributed to the place where it is to be raked. It shall be spread while hot upon the asphaltic concrete binder, which must be dry and free from foreign matter. The last load of the day shall be spread at least one hour prior to the official time of sunset. The lowest permissible temperature of the surface mixture, shall vary from two hundred and thirty (230) degrees Fahrenheit to two hundred and eighty (280) degrees Fahrenheit, according to the asphaltic cement used. After receiving its ultimate compression by rolling, it shall have a thickness of two (2) inches. The initial compression must be effected by means of a small roller, after which a small amount of hydraulic cement shall be swept over the surface. Final compression shall be effected by a roller of not less than two hundred (200) pounds per inch tread. The rate per hour of rolling with the heavier roller shall not exceed two hundred (200) square yards of surface.





The surface of the pavement at the concrete gutter flags shall be finished one-quarter ( $1/4$ ) inch above the gutters, a true edge and exact depth to be obtained by spreading the surface mixture and finishing the same to a templet of iron laid on the gutter flag.



ESTIMATE OF COST.



Division Street  
Creosoted Wood Block Pavement  
Width Of Roadway-42 ft.

Intersection	Volume Cu. yds.	Volume fill	Stone Curb Lineal Ft.	Pavement Sq. yds.	Gutter cut cu. yds.
Menard	105		124	165.1	2
Property line Menard to prop- erty line Mans- field	280		528.8	661	7
Intersection Mansfield	116		124	165.1	2
Property line Mansfield to property line Mayfield	253		528.4	660.5	7
Intersection Mayfield	101		124	165.1	2
Property line Mayfield to property line Mason	246		528.4	660.5	7
Intersection Mason	90		124	165.1	2
Property line Mason to property line Austin	220		528.4	660.5	7
Intersection Austin	117		124	165.1	2



## Intersection Menard.

Excavation	107 cu. yds. at	.58	62.06	
Stone Curb	124 lineal ft. at	.79	97.96	
Concrete filling	2 cu. yds at	.69	1.38	
Wood Block Paving	165.1 sq. yds at	3.22	531.6 2	
Inlet Gratings	4 at	.75	3.00	
6 % Engineering and Attorney fee			<u>41.76</u>	737.78

## Property line Menard to property line Mansfield.

Excavation	287 cu. yds	.58	166.46	
Stone Curb	528.8 ft.	.79	417.75	
Concrete filling	7 cu. yds at	.69	4.83	
Wood Block Paving	661 sq. yds.	3.22	2128. 42	
Inlet Gratings	0		0.00	
6 % Engineering and Attorney fees			<u>163.05</u>	2880.51

## Intersection Mansfield.

Excavation	118 cu. yds at	.58	68.44	
Stone Curb	124 ft. at	.79	97.96	
Concrete filling	2 cu. yds at	.69	1. 38	
Wood Block Paving	165 sq. yards at	3.22	531. 62	
Inlet Gratings	4	.75	3.00	
6 % Engineering and Attorney fees			<u>42.14</u>	744.54

Property Line Mansfield to property line Mayfield

Excavation	260 cu. yds at	.58	150.80	
Stone Curb	528.4 ft. at	.79	417.46	
Concrete filling	cu. yds. at	.69	4.83	
Wood Block Paving	660.5 sq. yds at	\$3.22	2126.81	
6% Engineerying & Attorney fees			<u>161.99</u>	<u>2861.89</u>





Intersection Mayfield Ave.

Excavation	103 cu. yds	at	.58	59.74	
	124 feet	at	.79	97.96	
Stone curb					
Concrete filling	2 cu. yds.	at	.69	1.38	
Wood Block Paving	165.1 sq.yds.	at	3.22	531.62	
Inlet Grating	4	at	.75	3.00	
6% Engineering and Attorney fees				<u>41.62</u>	735.32

Property line Mayfield Ave. to property line Mason Ave.

Excavation	253 cu. yds	at	.58	146.74	
Stone Curb	528.4 ft.	at	.79	417.46	
Concrete filling	7 cu. yds	at	.69	4.83	
				2126.81	
Wood Block Paving	660.5 sq. yds	at	3.22	=	
6% Engineering and Attorney fees				<u>161.75</u>	2857.59

Intersection Mason Ave.

Excavation	92 cu. yds.	at	.58	153.36	
Stone Curb	124 feet	at	.79	97.96	
Concrete Filling	2 cu. yds	at	.69	1.38	
Wood Block Paving	165.1 sq.yds	at	3.22	531.62	
Inlet Gratings	4	at	.75	3.00	
6% Engineering and Attorney fees				<u>47.12</u>	832.44

Property Line Mason Ave. to Property line Austin Ave.

Excavation	227 cu. yds.	at	.58	131.66	
Stone Curb	528.4 feet	at	.79	417.46	
Concrete filling	7 cu. yds	at	.69	4.83	
Wood Block Paving	660.5 sq.yds.	at	3.22	2126.81	
6% Engineering and Attorney fees at				<u>168.95</u>	2841.61

Intersection Austin Ave.

Excavation	119 cu. yds	at	.58	69.02	
Stone Curb	124 feet	at	.79	97.96	
Concrete filling	2 cu. yds	at	.69	1.38	



Wood Block Paving	165.1 sq.yds	at	3.22	531.62	
Inlet Gratings	4	at	.75	3.00	
6% Engineering & Attorney fees				<u>42.18</u>	<u>745.16</u>
					\$15,236.84

Assessment per foot of property line on Division Street

Property line Menard Ave. to property line Mansfield Ave.

Cost property line to property line	2880.51	
Cost Intersection Division St. and Menard Ave.	184.45	
Cost Intersection Division St. and Mansfield Ave.	<u>186.14</u>	\$ 3251.10
Assessment per foot of property line =	$\frac{3251.10}{2 \times 248.37}$	= \$6.55

Property line Mansfield Ave. to Mayfield Ave.

Cost property line to property line	\$2861.89	
Cost intersection Division St. and Mansfield Ave.	186.14	
" " " " " " Mayfield Ave.	<u>186.83</u>	3234.86
Assessment per foot of property line =	$\frac{\$3234.86}{2 \times 248.20}$	= \$6.51

Property line Mayfield Ave. to Mason Ave.

Cost property line to property line	\$2857.59	
" intersection Division St. & Mayfield Ave.	186.83	
" " " " " " Mason Ave.	<u>208.11</u>	3252.53
Assessment per foot of property line =	$\frac{\$3252.53}{2 \times 248.20}$	= \$6.55

Property line Mason Ave. to Austin Ave.

Cost from property line to property line	2841.61	
Cost intersection Division St. & Mason Ave.	208.11	
Cost " " " " " " Austin Ave.	<u>186.29</u>	\$ 3236.01
Assessment per foot of property line =	$\frac{3236.01}{2 \times 248.20}$	= \$6.52



North Ave.  
Creosoted Wood Block Pavement  
Width of Roadway- 50 ft. 0 inches

	Volume cut cu. yds.	volume fill cu. yds.	curb and gutter Feet	Pavement sq. yds	Gutter cut cu. yds.
Intersection Menard Ave	125		166	342	2
Property line Menard Ave. to property line Mansfield Avenue	320		528.8	956	7
Intersection Mansfield Ave.	124		166	342	2
Property line Mansfield Ave. to Property line Mayfield Ave.	408		528.4	954	7
Intersection Mayfield Ave.	192		166	342	2
Property line Mayfield to property line Mason Ave.	370		528.4	954	7
Intersection Mason Ave.	168		166	342	2
Property line Mason Ave. to property line Austin Ave.	455		528.4	954	7
Intersection Austin Ave.	185		166	342	2



Excavation	127 cu. yds	at	.58	73.66	
Curbing	166 feet	at	.79	131.14	
Concrete filling	2 cu. yds	at	.69	1.38	
Pavement	342 sq. yds.	at	3.22	1101.24	
Inlet Gratings	4	at	.75	3.00	
6% Engineering & Attorney fees				<u>78.63</u>	1389.05

## Property line Menard Ave. to property line Mansfield Ave.

Excavation	327 cu. yds	at	.58	189.66	
Stone Curbing	529 feet	at	.79	417.91	
Concrete fill	7 cu. yds.	at	.69	4.83	
Pavement	956 sq. yds	at	3.22	3078.32	
6% Engineering and Attorney fees				<u>221.44</u>	3912.16

## Intersection Mansfield Ave.

Excavation	126 cu. yds.	at	.58	73.08	
Stone Curb	166 feet	at	.79	131.14	
Inlet Gratings	4	at	.75	3.00	
Concrete	2 cu. yds	at	.69	1.38	
Pavement	342 sq. yds.	at	3.22	1101.24	
6% Engineering and Attorney fees				<u>78.56</u>	1388.40

## Property Mansfield to property line Mayfield Ave.

Excavation	415 cu. yds	at	.58	240.70	
Stone Curb	528 1/2 feet	at	.79	417.51	
Concrete	7 cu. yds	at	.69	4.83	
Pavement	954 Sq. yds	at	3.22	3071.88	
6% Engineering and Attorney fees				<u>224.10</u>	3959.02

## Intersection Mayfield Ave.

Excavation	194 Cu. yds	at	.58	112.52	
Stone Curb	166 feet	at	.79	131.14	
Concrete	2 cu. yds	at	.69	1.38	
Pavement	342 sq. yds.	at	3.22	1101.24	
Inlet Gratings	4	at	.75	3.00	
6% Engineering and Attorney fees				<u>80.95</u>	1430.24





## Property line Mayfield Ave. to Property line Mason Ave.

Excavation	377 cu. yds	at	.58	218.66	
Stone Curb	528 feet	at	.79	417.12	
Concrete	7 cu. yds	at	.69	4.83	
Pavement	954 sq. yds.	at	3.22	3071.88	
6% Engineering and Attorney fees				<u>227.75</u>	3940.24

## Intersection Mason Ave.

Excavation	170 cu. yds.	at	.58	98.60	
Curbing	166 feet	at	.79	131.14	
Concrete	2 cu. yds.	at	.69	1.38	
Pavement	342 sq. yds	at	3.22	1001.24	
Inlet Grating	4	at	.75	3.00	
6% Engineering and Attorney fees at				<u>80.12</u>	1415.48

## Property line Mason Ave. to property line to Austin Ave.

Excavation	462 cu. yds	at	.58	267.96	
Stone Curb	528 feet	at	.79	417.12	
Concrete	7 cu. yds	at	.59	4.83	
Pavement	954 sq. yds	at	3.22	3071.88	
6% Engineering and Attorney fees				<u>225.71</u>	3987.50

## Intersection Austin Ave.

Excavation	187 cu. yds.	at	.58	108.46	
Stone Curb	166 feet	at	.79	131.14	
Concrete	2 cu. yds	at	.69	1.38	
Pavement	342 sq yds.	at	\$3.22	1101.24	
Inlet Gratings	4	at	.75	3.00	
6% Engineering and Attorney fees				<u>80.71</u>	1425.93

Grand Total---\$22,848.02



( North Ave.Cont'd)

Assessment per foot of property line on North Ave.

Property line Menard Ave. to property line Mansfield Ave.

Cost property line to property line	3912.16	
Cost of intersection Menard Ave. and North Ave.	347.26	
" " " Mansfield Ave. and North Ave.	<u>347.10</u>	4606.52

$$\text{Assessment per foot of property line} = \frac{4606.52}{2 \times 248.37} = \$9.27$$

Property line Mansfield to property line Mayfield Ave.

Cost property line to property line	3959.02	
" intersection of Mansfield and North Ave.	347.10	
" " " Mayfield " " "	<u>357.56</u>	4663.68

$$\text{Assessment per foot of property line} = \frac{4663.68}{2 \times 248.20} = \$9.39$$

Property line Mayfield to property line to Mason Ave.

Cost property line to property line.	3940.24	
" of intersection Mayfield Ave. and North Ave.	357.56	
" " " Mason Ave. " " "	<u>353.87</u>	4651.64

$$\text{Assessment per foot of property line} = \frac{4651.64}{2 \times 248.20} = \$9.37$$

Property line Mason Ave. to property line Austin Ave.

Cost property line to property line.	3987.50	
Cost intersection Mason Ave. and North Ave.	353.37	
" " " North Ave. and Austin Ave.	<u>356.48</u>	4697.85

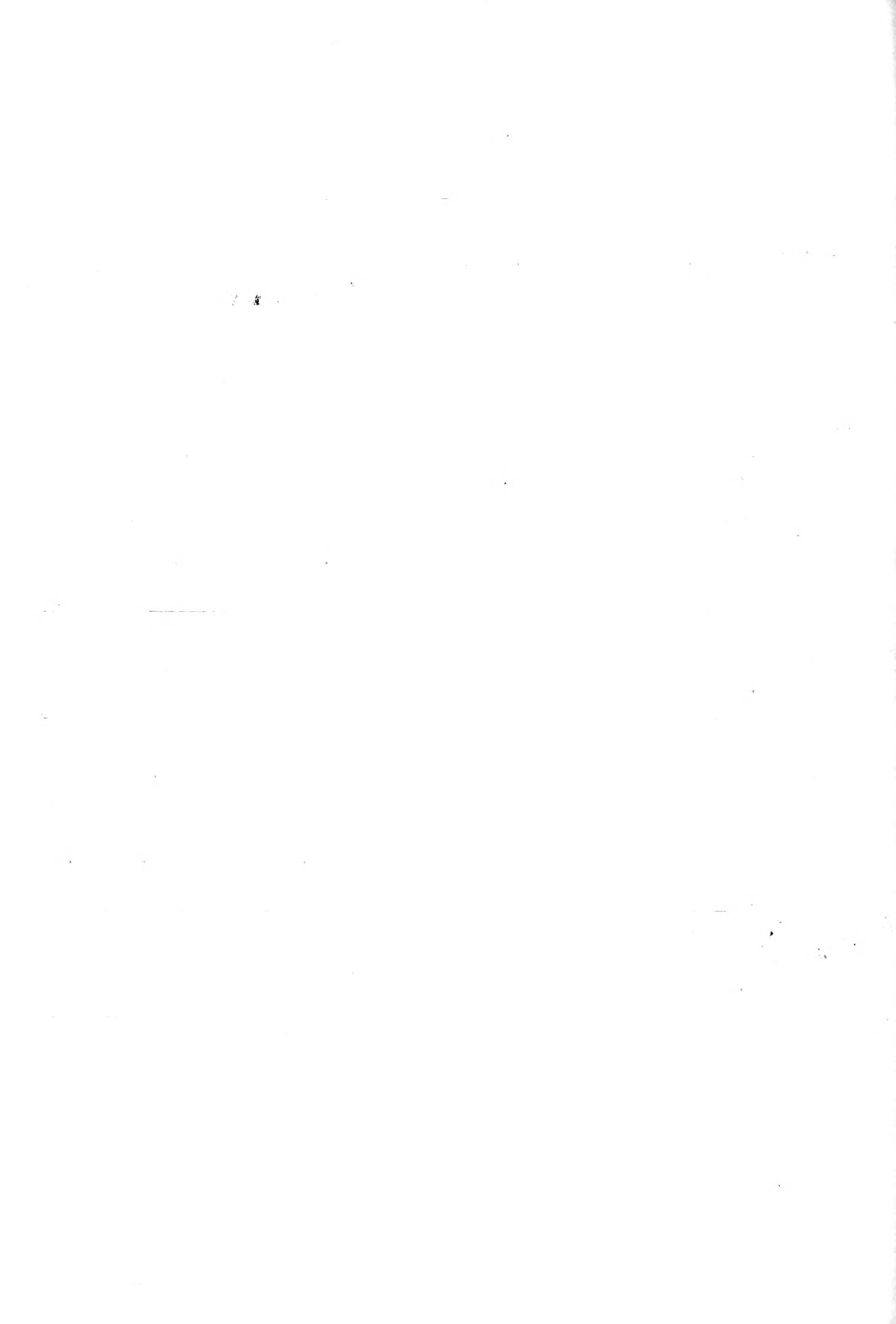
$$\text{Assessment per foot property line} = \frac{4697.85}{2 \times 248.20} = \$9.46$$



Menard Ave.  
Sheet Asphalt Pavement

Width of roadway-30ft. 0 in.

	Volume cut cu. yds.	Volume fill cu. yds.	curb and gutter ft.	Pavement sq. yds	Gutter cut cu.yds.
Property line Division to property line Potomac	750		1228.24	1731	47.5
Intersection Menard Ave. & Potomac Ave.	200		144	306.2	5 1/3
Property line Potomac Ave. to 572 Property line to Hirsch Street,			1186.26	1716.4	44
Intersection Hirsch St. to Menard Ave.	145		144	306.2	5 1/3
Intersection LeMoyne and Menard	154		144	306.2	5 1/3
Property line Lemoyne to property line North Ave.	103	61	1194.88	1691.6	44.3
Intersection North Ave. & Menard Avenue			172		64



(Menard Ave. Cont'd)

## Property line Division to Property line Potomac Ave.

Excavation	797.5 cu. yds	at .58	\$462.55	
Curb	1228.3 feet	at .72	884.33	
Pavement	1731 sq. yds.	at 1.75	3029.25	
Inlets	2	at .75	1.50	
Cinders	47.5 cu. yds.	at .69	33.05	
6% Engineering and attorney fees			<u>264.34</u>	4675.32

## Intersection Potomac Ave.

Excavation	205 cu. yds.	at .58	118.90	
Curb	144 ft.	at .72	103.68	
Cinders	5 cu. yds	at .69	3.45	
Pavement	306.2 sq. yds	at 1.75	535.25	
Inlets	4	at .75	3.00	
6% Engineering and attorney fees			<u>45.29</u>	810.77

## Property line Potomac Ave. to property line Hirsch St.

Excavation	616 cu yds..	at .58	357.28	
Curb	1188.3 feet	at .72	855.58	
Cinders	44 cu. yds	at .69	30.36	
Pavement	1716.4 sq. yds.	at 1.75	3003.70	
Inlets	2	at .75	1.50	
6% Engineering and attorney fees			<u>254.27</u>	4504.39

## , Intersection Hirsch Street.

Excavation	150 cu. yds.	at .58	87.00	
Curb	144 ft.	at .72	103.68	
Cinders	5 cu. yds	at .69	3.45	
Pavement	306.2 sq. yds.	at \$1.75	535.25	
Inlets	4 at	.75	3.00	
6% for Engineering and Attorney fees			<u>43.89</u>	776.87





## Property line Hirsch St. to property line LeMoyne St

Excavation	380 cu. yds	at	.58	\$220.40	
Curb	1188.26 ft.	at	.72	855.58	
Cinders	44 cu. yds	at	.69	30.36	
Pavement	1716.4 sq. yds	at	1.75	3003.70	
Inlet	2	at	.75	1.50	
6% Engineering and Attorney fees				<u>248.94</u>	4390.03

## Intersection Le Moyne Street

Excavation	159 cu. yds.	at	.58	92.22	
Curb	144 ft.	at	.72	103.68	
Cinder	5 cu. yds.	at	.69	3.45	
Pavement	306.2 sq. yds	at	1.75	535.85	
Inlet Gratings	4	at	.75	3.00	
6% for engineering and attorney fees				<u>44.29</u>	782.49

## Property line Lemoyne St. to property line North Ave.

Excavation	177 cu. yds.	at	.58	102.66	
Cinders	61 cu. yds	at	.69	42.09	
Curb	1194.8 feet	at	.72	860.33	
Cinder fill	44 cu. yds	at	.69	30.36	
Pavement	1692.0 sq. yds.	at	1.75	2961.00	
Inlet	2	at	.75	1.50	
6% Engineering and Attorney fees				<u>239.88</u>	4237.82

Grand total \$20,177.69

## Assessment per foot of property line on Menard Ave.

Pre-rating

Cost property line Potomac Ave. to property line Division St.	\$ 4675.32	
Cost intersection Division St. & Menard Ave.	184.45	
Cost intersection Potomac Ave. & Menard Ave.	<u>202.79</u>	5062.56



$$\text{Assessment per foot of property line} = \frac{5062.56}{2 \times 578.12} = \$4.38$$

Cost property line Potomac Ave. to property line Hirsch St.

Cost property line to property line 4504.39

Cost intersection Potomac Ave. & Menard Ave. 202.79

Cost intersection Menard and Hirsch St. 193.84 4901.02

$$\text{Assessment per foot of property line} = \frac{4901.02}{2 \times 594.13} = \$4.13$$

Property line Hirsch St. to property line Le Moyne St.

Cost property line to property line 4390.03

Cost Intersection Hirsch St. to Menard Ave 193.04

Cost Intersection Le Moyne St. & Menard Ave. 195.62 4779.49

$$\text{Assessment per foot of property line} = \frac{4779.49}{2 \times 594.13} = \$4.02$$

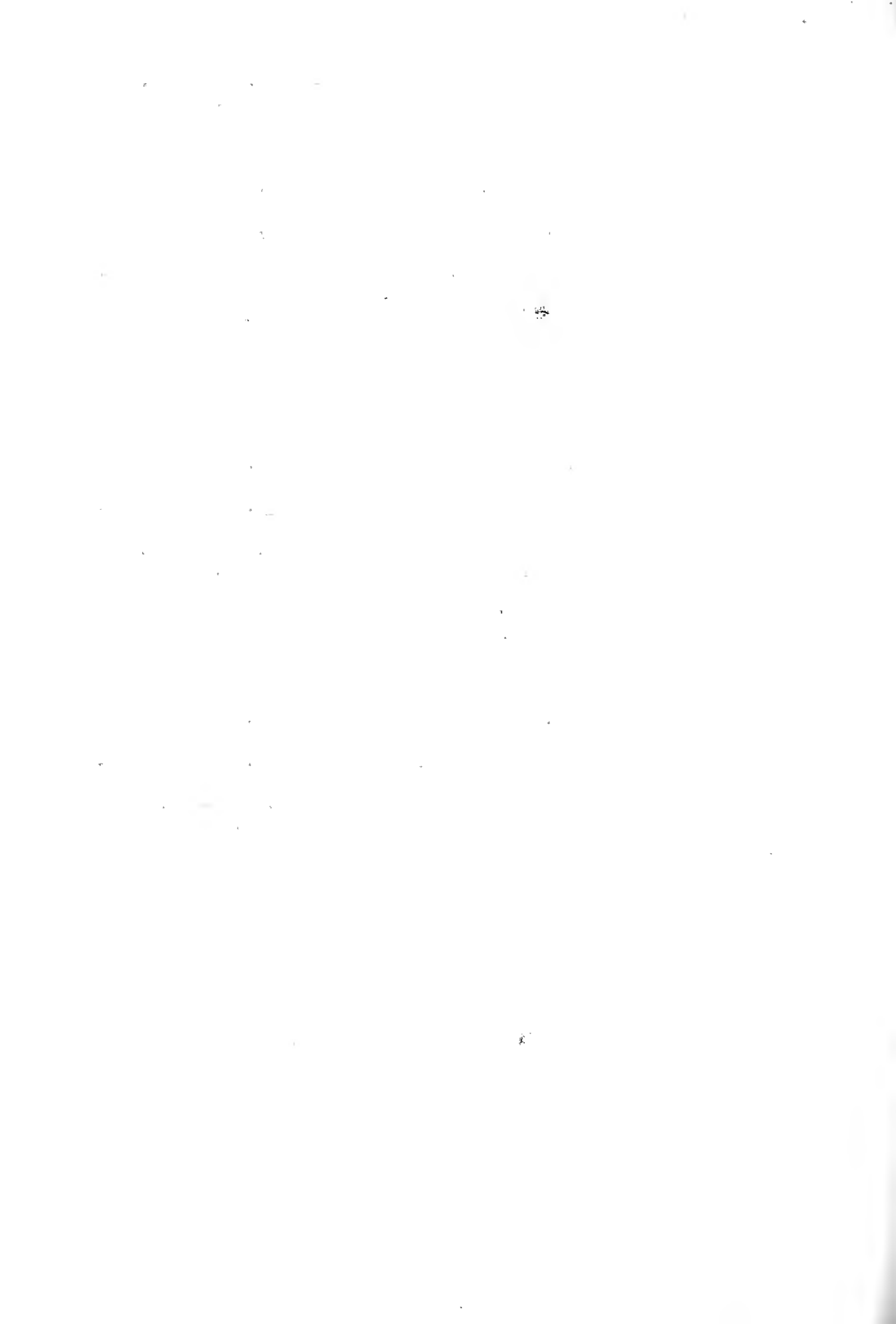
Property line Le Moyne St. to property line North Ave.

Cost property line to property line 4237.82

Cost intersection Le Moyne St. & Menard Ave 195.62

Cost intersection North Ave. & Menard Ave. 347.26 4780.70

$$\text{Assessment per foot of property line} = \frac{4780.70}{2 \times 561.44} = \$4.26$$



Mansfield Ave.  
Sheet Asphalt Pavement.  
Width of Roadway = 30ft. 0 in.

Volume cut cu. yds.	Volume fill cu. yds.	curb & gutter feet	Pavement sq. yds.	Gutter cut cu. yds.
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Intersection  
Division St. &  
Mayfield Ave.

Property line  
Division to  
property line  
Potomac Ave.

987

1228.24

1731

47 1/2

Intersection Potomac &  
Mayfield Ave.

148

144

306.2

5 1/3

Property line  
Potomac to prop-  
erty line Hirsch St.

523

1188.26

1716.4

44

Intersection Hirsch  
St. & Mansfield Ave. 107

144

306.2

5 1/3

Property, line Hirsch  
toproperty line  
Le Moyne St.

378

1188.26

1716.4

44

Intersection LeMoyne  
St. & Mansfield Ave.

96

144

306.2

5 1/3

Property line  
Le Moyne St. to  
property line  
North Ave.

571

1194.88

1691.6

44 1/3

Intersection  
North Ave. and  
Mansfield Ave.

172

6.4



## Property line Division St. to property line Potomac Ave.

Excavation	1035 cu. yds.	at	.58	\$600.30
Curbing	1228.3 ft.	at	.72	884.33
Cinders	47.5 cu.yds.	at	.69	33.05
Pavement	1731 sq. yds.	at	1.75	3029.25
Inlets	2	at	.75	1.50
6% Engineering and Attorney fees				<u>272.91</u>

4821.34

## Intersection Potomac Ave.

Excavation	153 cu. yds.	at	.58	88.74
Curbing	144 ft.	at	.72	103.68
Cinders	5 cu.yds	at	.69	3.45
Pavement	306.2 sq. yds.	at	1.75	535.85
Inlets	4	at	.75	3.00
6% Engineering and Attorney fees				<u>44.06</u>

778.80

## Property line Potomac Ave. to Property line Hirsch St

Excavation	567 cu. yds.	at	.58	328.86
Curbing	1188.3 ft.	at	.72	855.58
Cinders	44 cu. yds.	at	.69	30.36
Pavement	1716.4 sq. yds.	at	1.75	3003.70
Inlets	2	at	.75	1.50
6% Engineering and Attorney fees				<u>253.20</u>

4473.20

## Intersection Hirsch Street

Excavation	112 cu. yds.	at	.58	64.96
Curbing	144 ft.	at	.72	103.68
Cinders	5 cu. yds	at	.69	3.45
Pavement	306.2 sq. yds	at	1.75	535.85
Inlets	4	at	.75	3.00
6% for Engineering and Attorney fees				<u>42.66</u>

753.60

## Property line Hirsch St. to property line Le Moyne St.





(Mansfield Cont'd)

Excavation	422 cu. yds	at .58	244.76	
Curbing	1188.26 ft.	at .72	885.58	
Cinders	44 cu. yds	at .69	30.36	
Pavements	1716.4 sq. yds	at 1.75	3003.70	
Inlets	2	at .75	1.50	
6% Engineering and Attorney fees			<u>249.95</u>	4415.85

## Intersection Le Moyne Street

Excavation	101 cu. yds	at .58	58.58	
Curbing	144 ft.	at .72	103.68	
Cinders	5 cu. yds.	at .69	3.45	
Pavements	306.2 sq. yds	at 1.75	535.85	
Inlet Gratings	4	at .75	3.00	
6% Engineering and Attorney fees			<u>42.27</u>	746.83

## Property line Le Moyne St. to property line North Ave.

Excavation	615 cu. yds	at .58	356.70	
Curbing	1194.9	at .72	860.33	
Cinders	44 cu. yds	at .69	30.36	
Pavements	1692 sq. yds.	at 1.75	2961.00	
Inlets	2	at .75	1.50	
6% Engineering and attorney fees			<u>252.58</u>	4462.47

Grand Total-- \$20,451.89

Assessment per foot of property line on Mansfield Ave.

## Property line Division St. to property line Potomac Ave.

Cost from property line to property line	4821.34	
Cost intersection Division St. & Mansfield Ave.	186.14	
Cost intersection Potomac & Mansfield Aves.	<u>194.70</u>	\$ 5202.18

Assessment per foot of property line =  $\frac{5202.18}{2 \times 578.12} = \$4.50$

## Property line Potomac Ave. to Hirsch St.

Cost from property line to property line	4473.20
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Cost intersection Hirsch St. & Mansfield Ave.	188.40	
Cost intersection Potomac Ave. & Mansfield Ave.	<u>194.70</u>	4856.30
Assessment per foot of property line = $\frac{4856.30}{2 \times 594.13} = \$4.09$		

Property line Hirsch St. to property line Le Moyne St.

Cost from property line to property line	4415.85	
cost intersection Hirsch St. & Mansfield Ave.	188.40	
cost intersection Le Moyne St. & Mansfield Ave.	<u>186.71</u>	4790.96
Assessment per foot of property line = $\frac{4790.96}{2 \times 594.13} = \$4.03.$		

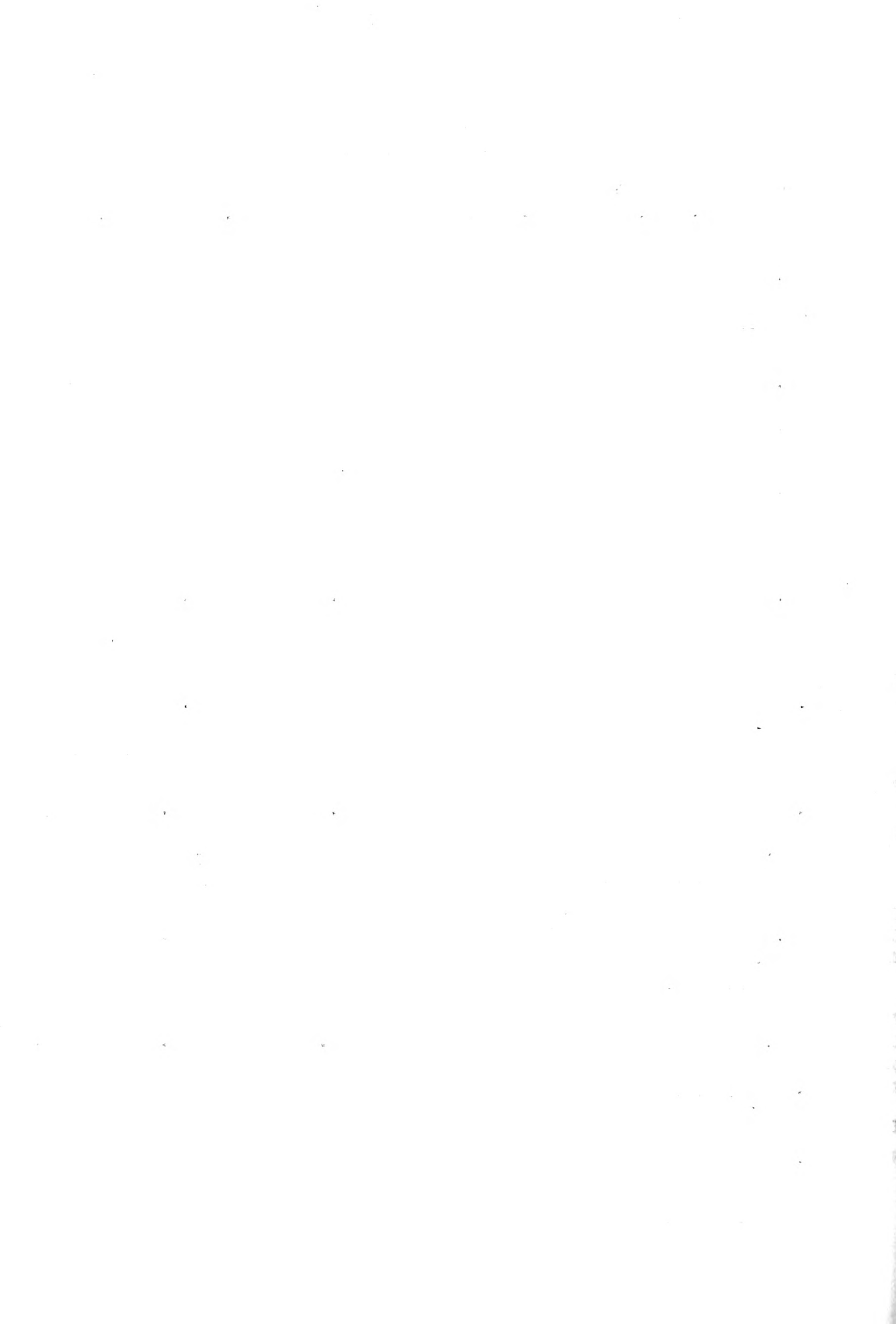
Property line Le Moyne St. to property line North Ave.

Cost from property line to property line	4462.47	
cost intersection North and Mansfield Aves.	347.10	
cost intersection Le Moyne St. and Mansfield Ave.	<u>186.71</u>	4996.28
Assessment per foot of property line = $\frac{4996.28}{2 \times 561.44} = \$4.45.$		



Mayfield Ave.  
Sheet Asphalt Pavement  
Width of Roadway- 30 ft. 0 in.

	Volume cut cu. yds.	Volume fill cu. yds.	Combined curb and gutter ft.	Pavement sq. yds.	Gutter cut cu. yds.
Intersection Division St. Mansfield Ave.			144		5 1/3
Property line Division St. to property line Potomac Ave.	866		1228.24	1731	47 1/2
Intersection Potomac Ave. and Mansfield Ave.	222		144	306.2	5 1/3
Property line Potomac Ave. to property line Hirsch Street	775		1188.26	1716.4	44
Intersection Hirsch St. & Mansfield Ave.	178		144	306.2	5 1/3
Property line Hirsch St. to property line Le Moyne St.	1077		1188.26	1716.4	44
Intersection Le Moyne St. & Mansfield Ave.	168		144	306.2	5 1/3
Property line Le Moyne St. to property line North Ave.	1094		1194.88	1691.6	44.3
Intersection North Ave.			172		6.4



## Property line Division St. to property line Potomac Ave.

Excavation	913 cu. yds.	at	.58	\$529.54	
Curbing	1228.3 ft.	at	.72	884.33	
Cinders	47.5 cu. yds	at	.69	33.05	
Pavements	1731 sq. yds	at	1.75	3029.25	
Inlets	2	at	.75	1.50	
6% Engineering and attorney fees				<u>268.66</u>	4746.33

## Intersection Potomac Ave.

Excavation	227 cu. yds.	at	.58	131.66	
Curbing	144 ft.	at	.72	103.68	
Cinders	5 cu. yds	at	.69	3.45	
Pavements	306.2 sq. yds.	at	1.75	535.85	
Inlets	4	at	.75	3.00	
6% Engineering and attorney fees				<u>46.66</u>	824.30

## Property line Potomac Ave. to property line Hirsch St.

Excavation	819 cu. yds.	at	.58	475.02	
Curbing	1188.3 ft.	at	.72	855.58	
Cinders	44 cu. yds.	at	.69	30.36	
Pavements	1716.4 sq. yds	at	1.75	3003.70	
6% for engineering and attorney fees				261.97	
Inlets	2	at	.75	<u>1.50</u>	4628.13

## Intersection Hirsch Street

Excavation	183 cu. yds.	at	.58	106.14	
Curbs	144 ft.	at	.72	103.68	
Cinders	5 cu. yds	at	.69	3.45	
Pavements	306.2 sq. yds	at	1.75	535.85	
Inlets	4	at	.75	3.00	
6% Engineering and attorney fees				<u>45.13</u>	795.25





## Property line Hirsch to Property line Le Moyne St.

Excavation	1121 cu. yds.	at	.58	\$650.18	
Curbing	1188.3 ft.	at	.72	855.58	
Cinders	44 cu. yds	at	.69	30.36	
Pavements	1716.4 sq. yds.	at	1.75	3003.70	
Inlets	2	at	.75	1.50	
6% Engineering and attorney fees				<u>272.48</u>	4813.80

## Intersection Le Moyne Street

Excavation	173 cu. yds.	at	.58	100.34	
Curbing	144 ft.	at	.72	103.68	
Cinders	5 cu. yds	at	.69	3.45	
Pavements	306.2 sq. yds	at	1.75	535.85	
Inlets	4	at	.75	3.00	
6% Engineering and attorney fees				<u>44.78</u>	791.10

## Property line Le Moyne St. to property line North Ave.

Excavation	1138 cu. yds.	at	.58	660.04	
Curbing	1194.9 feet	at	.72	860.33	
Cinders	44 cu. yds.	at	.69	30.36	
Pavements	1692.0 sq. yds.	at	1.75	2961.00	
Inlets	2	at	.75	1.50	
6% Engineering and attorney fees				<u>210.79</u>	<u>3724.02</u>

Grand total 20,322.93

Assessment per foot of property line on Mayfield Ave

## Property line Division St. to property line Potomac Ave.

Cost property line to property line	4746.33	
Cost intersection Mayfield Ave. & Division St.	183.83	
Cost intersection Potomac Ave. & Mayfield Ave.	<u>206.08</u>	5136.24



(Mayfield Ave Cont'd.)

Assessment per foot of property line =  $\frac{5136.24}{2 \times 578.12} = \$4.44.$

Property line Potomac Ave. to property line Hirsch St.

Cost from property line to property line	4628.13	
Cost intersection Potomac Ave. & Mayfield	206.08	
Cost intersection of Hirsch St. & Mayfield Ave.	<u>198.81</u>	5033.02

Assessment per foot of property line =  $\frac{5033.02}{2 \times 594.13} = \$4.24$

Property line Hirsch St. to property line Le Moyne St.

Cost from property line to property line	4813.80	
cost intersection Hirsch St. & Mayfield Ave.	198.81	
cost intersection Le Moyne St. & Mayfield Ave.	<u>197.78</u>	5210.39

Assessment per foot of property line =  $\frac{5210.39}{2 \times 594.13} = \$4.39$

Property line Le Moyne St. to property line North Ave.

Cost property line to property line	3724.02	
Cost intersection Le Moyne St. & Mayfield Ave.	197.78	
Cost intersection North Ave. & Mayfield Ave.	<u>357.56</u>	4279.36

Assessment per foot of property line =  $\frac{4279.36}{2 \times 561.44} = \$3.81$



Mason Ave.  
Sheet Asphalt Pavement

Width of Roadway-30ft 0 in.

	Volume cut cu. yds.	volume fill cu. yds.	curb gutter feet	Pavement sq. yds.	Gutter filler cu. yds.
Property line Division St. to property line Potomac Ave.	1225		1228.24	1731	47 1/2
Intersection Potomac Ave.	259		144	306.2	5 1/3
Property line Potomac Ave. to property line Hirsch Street	976		1188.26	1716.4	44
Intersection Hirsch Street	109		144	306.2	5 1/3
Property line Hirsch St. to property line Le Moyne St.	848		1188.26	1716.4	44
Intersection Le Moyne St.	209		144	306.2	5 1/3
Property line Le Moyne St. to property line North Ave.	705		1194.88	1691.6	44 1/3
Intersection North Avenue			172		6.4



(Mason Ave. Cont'd.)

## Property line Division St. to property line Potomac Ave.

Excavation	1272 cu. yds.	at .58	737.76	
Curbing	1228.3 feet	at .72	884.33	
Cinders	47.5 cu. yds.	at .69	33.05	
Pavements	1731 sq. yds.	at 1.75	3029.25	
Inlets	2	at .75	1.50	
6% Engineering and attorney fees			<u>221.15</u>	3907.04

## Intersection Potomac Ave.

Excavation	264 cu. yds.	at .58	153.12	
Curbing	144 ft.	at .72	103.68	
Cinders	5 cu. yds.	at .69	3.45	
Pavements	306.2 sq. yds.	at 1.75	535.85	
Inlets	4	at .75	3.00	
6% Engineering and attorney fees			<u>47.95</u>	847.05

## Property line Potomac Ave. to property line Hirsch St.

Excavation	1020 cu. yds	at .58	591.60	
Curbing	1188.3 ft.	at .72	855.58	
Cinders	44 cu. yds	at .69	30.36	
Pavements	1716.4 sq. yds	at 1.75	3003.70	
Inlets	2	at .75	1.50	
6% Engineering and attorney fees			<u>268.96</u>	4751.70

## Intersection Hirsch Street.

Excavation	114 cu. yds.	at .58	66.12	
Curbing	144 ft.	at .72	103.68	
Cinders	5 cu. yds.	at .69	3.45	
Pavements	306.2 sq. yards	at 1.75	535.85	
Inlets	4	at .75	3.00	
6% Engineering and attorney fees			<u>42.73</u>	754.83





## Property line Hirsch St. to property line Le Moyne St.

Excavation	892 cu. yds.	at	.58	517.36	
Curbing	1188.3 ft.	at	.72	885.58	
Cinders	44 cu. yds	at	.69	30.36	
Pavements	1716.4 sq. yds.	at	1.75	3003.70	
Inlets	2	at	.75	1.50	
6% Engineering and attorney fees				<u>266.31</u>	4704.81

## Intersection Le Moyne Street.

Excavation	214 cu. yds.	at	.58	124.12	
Curbing	144 ft.	at	.72	103.68	
Cinders	5 cu yds.	at	.69	3.45	
Pavements	306.2 sq. yds.	at	1.75	535.85	
Inlets	4	at	.75	3.00	
6% Engineering and attorney fees				<u>46.21</u>	816.31

## Property line Le Moyne St. to Property line North Ave.

Excavation	749 cu. yds.	at.	.58	434.42	
Curbing	1194.9 ft.	at.	.72	860.33	
Cinders	44 cu. yds	at	.69	30.36	
Pavements	1692.0 sq. yds	at	1.75	2961.00	
Inlets	2 at		.75	1.50	
6% Engineering and attorney fees				<u>257.26</u>	<u>4544.87</u>

Grand total 20 326.61

Assessment per foot of property on Mason Ave.

## Property line Division St. to property line Potomac Ave.

Cost from property line to property line	3907.04	
Cost of intersection Division St. & Mason Ave.	208.11	
Cost of intersection Potomac and Mason Aves.	<u>211.73</u>	4326.91
Assessment per foot of property line	<u>4326.91</u>	- \$3.66

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## Property line Potomac Ave. to Hirsch Street

Cost from property line to property line	4751.70	
Cost of intersection Potomac Ave. and Mason Ave.	211.76	
Cost of intersection Hirsch St. & Mason Ave.	<u>188.46</u>	5151.92
Assessment per foot of property =	$\frac{5151.92}{2 \times 594.13}$	= \$4.34

## Property line Hirsch St. to property line Le Moyne St.

Cost from property line to property line	4740.81	
Cost of intersection Hirsch St. and Mason Ave.	188.46	
Cost of intersection Le Moyne St. and Mason Ave.	<u>204.08</u>	5097.35
Assessment per foot of property line equals	$\frac{5097.35}{2 \times 594.13}$	equals \$4.30

## Property line Le Moyne St. to property line North Ave.

Cost from property line to property line Hirsch St.	4544.87	
Cost intersection of Le Moyne St. and Mason Ave.	204.08	
Cost intersection of North Ave. " " "	<u>353.87</u>	5102.82
Assessment per foot of property line equals	$\frac{5102.82}{2 \times 561.44}$	= \$4.54



## Austin Ave.

## Sheet Asphalt Pavement

Width of Roadway- 30 ft. 0 in.

	Volume cut cu. yds.	volume fill cu. yds.	combined curb & gutter ft.	Pavement sq. yds.	Gutter cut cu. yards
Property line Division St. to property line Potomac Ave.	307		1228.24	1731	47.5
Intersection Potomac Ave.	64		144	306.2	5 1/3
Property line Potomac Ave. to property line Hirsch Street	828		1188.26	1716.4	44
Intersection Hirsch St.	129		144	306.2	5 1/3
Property line Hirsch St. to property line Le Moyne St.	919		1188.26	1716.4	44
Intersection Le Moyne St.	87		144	306.2	5 1/3
Property line Le Moyne St. to property line North Ave.	913		1194.88	1691.6	44.3
Intersection North Ave.			172		6.4



## Property line Division St. to property line Potomac Ave.

Excavation	3 55 cu. yds.	at	.58	312.40	
Curbing	1228.24 ft.	at	.72	884.33	
Cinders	47.5 cu. yds.	at	.69	33.05	
Pavements	1731 sq. yds.	at	1.75	3029.25	
Inlets	2	at	.75	1.50	
6% Engineering and attorney fees				<u>255.63</u>	4516.16

## Intersection Potomac Ave.

Excavation	69 cu. yds	at	.58	\$40.02	
Curbing	144 ft.	at	.72	103.68	
Cinders	5 cu. yds.	at	.69	3.45	
Pavements	306.2 sq. yds	at	1.75	535.85	
Inlets	4	at	.75	3.00	
6% Engineering and attorney fees				<u>41.16</u>	727.16

## Property line Potomac Ave. to property line Hirsch St

Excavation	872 cu. yds.	at	.58	505.76	
Curbing	1188.3 ft.	at	.72	855.58	
Cinder fill	44 cu. yds	at	.69	30.36	
Pavements	1716.4 sq. yds	at	1.75	3003.70	
Inlets	2	at	.75	1.50	
6% Engineering and attorney fees				<u>263.81</u>	4660.71

## Intersection Hirsch Street

Excavation	134 cu. yds	at	.58	77.72	
Curbing	144 ft.	at	.72	103.68	
Cinders	5 cu. yds.	at	.69	3.45	
Pavements	306.2 sq. yds	at	1.75	535.85	
Inlets	4	at	.75	3.00	
6% for Engineering and attorney fees				<u>43.42</u>	767.12





## Property line Hirsch to, property line Le Moyne St.

Excavation	963 cu. yds.	at	.58	558.54	
Curbing	1188.3 <del>ft.</del>	at	.72	885.58	
Cinders	44 cu. yds.	at	.69	30.36	
Pavement	1716.4 sq. yds	at	1.75	3003.70	
Inlets	2	at	.75	1.50	
6% Engineering and attorney fees				<u>268.78</u>	4748.46

## Intersection Le Moyne Street

Excavation	92 cu. yds	at	.53	53.36	
Curbing	144 ft.	at	.72	103.68	
Cinders	5 cu. yds	at	.69	3.45	
Pavement	306.2 sq. yds.	at	1.75	535.85	
Inlets	4	at	.75	3.00	
6% Engineering and attorney fees				<u>41.96</u>	741.30

## Property line Le Moyne St, to property line North Ave.

Excavation	957 cu. yds	at	.53	555.06	
Curbing	1194.9 ft.	at	.72	860.33	
Cinders	44 cu. yds.	at	.69	30.36	
Pavement	1692 sq.yds	at	1.75	2961.00	
Inlets	2	at	.75	1.50	
6% Engineering and attorney fees				<u>264.50</u>	<u>4672.75</u>

Grand Total..... \$ 20,833.66

Assessment per foot of property on Austin Ave.

## Property line Division St. to property line Potomac Ave..

Cost from property line to property line	4516.16	
Cost intersection Division St. & Austin Ave.	186.29	
Cost intersection Potomac Ave. & Austin Ave.	<u>181.79</u>	4884.24

Assessment per foot of property line 4884.24 = \$4.23.

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## Property line Potomac Ave. to property line Hirsch St.

Cost from property line to property line	4660.71	
Cost intersection Potomac Ave. & Austin Ave.	181.79	
Cost intersection Hirsch St. & Austin Ave.	191.78	
	<hr/>	5034.28
Assessment per foot of property line =	$\frac{5034.28}{2 \times 594.13}$	= \$4.24

## Property line Hirsch St. to property line Le Moyne St.

Cost property line Hirsch St. to property line Le Moyne St.	4748.46	
Cost intersection Hirsch St. & Austin Ave.	191.78	
Cost intersection Le Moyne St. & Austin Ave.	<hr/> 185.33	5125.57
Assessment per foot of property line =	$\frac{5125.57}{2 \times 594.13}$	= 4.32

## Property line Le Moyne St. to North Ave.

Cost property line Le Moyne St. to property line North Ave.	4672.75	
cost intersection Le Moyne St. & Austin Ave.	185.33	
cost intersection North Ave. & Austin Ave.	<hr/> 356.48	5214.56
Assessment per foot of property line equals	$\frac{5214.56}{2 \times 561.44}$	= \$4.65



## Potomac Ave.

## Sheet Asphalt Pavement

Width of Roadway 30 ft. 0 in.

	Volume cut cu. yds.	volume fill cu. yds.	curb and gutter ft.	Pavement sq.yds.	Gutter cut cu.yds.
Property line Menard to property line Mansfield Ave.	199		532.75	830	19.75
Property line Mansfield to property line Mayfield Ave.	132		532.4	828.5	19.7
Property line Mayfield to property line Mason	212		532.4	828.5	19.7
Property line Mason Ave. to property line Austin Ave..	163		532.4	828.5	19.7



## Property line Menard to property line Mansfield

Excavation	219 cu. yds.	at	.58	127.02	
Curbing	532.8 ft.	at	.72	383.62	
Cinders	20 cu. yds	at	.69	13.80	
Pavement	830 cu. yds.	at	1.75	1452.50	
Inlets	0			0.00	
6% Engineering and attorney fees				<u>118.60</u>	2095.54

## Property line Mansfield Avato property line Mayfield Ave.

Excavation	152 cu. yds.	at	.58	88.16	
Curbing	532.4 ft.	at	.72	383.33	
Cinders	20 cu. yds.	at	.69	13.80	
Pavement	828.5 sq. yds	at	1.75	1449.87	
6% Engineering and attorney fees				<u>116.11</u>	2051.27

## Property line Mayfield Ave. to property line Mason Ave .

Excavation	232 cu. yds	at	.58	128.56	
Curbing	532.4 ft.	at	.72	383.33	
Cinders	20 cu. yds.	at	.69	13.80	
Pavement	828.5 sq. yds.	at	1.75	1449.87	
6% Engineering and attorney fees				<u>118.53</u>	2094.09

## Property line Mason to property line Austin Ave.

Excavation	183 cu. yds.	at	.58	106.14	
Curbing	532.4 ft.	at	.72	383.33	
Cinders	20 cu. yds.	at	.69	13.80	
Pavement	828.5 sq. yds.	at	1.75	1449.87	
6% Engineering and attorney fees				<u>117.19</u>	<u>2070.33</u>

Grand Total-- \$8311.23





Assessment per foot on property on Potomac Ave.

Property line Menard Ave. to, property line Mansfield Ave.

Cost property line to property line	2095.54	
Cost intersection Potomac Ave. to Menard Ave.	202.79	
Cost intersection Potomac Ave. & Mansfield Ave.	<u>194.70</u>	2493.03
Assessment per foot of property line =	$\frac{\$2493.03}{2 \times 248.37}$	=

Property line Mansfield to property line to Mayfield Ave.

Cost from property line to property line	2051.27	
Cost intersection Potomac and Mansfield Ave.	194.70	
Cost intersection Potomac Ave. & Mayfield Ave.	<u>206.08</u>	2452.05
Assessment per foot of property line =	$\frac{\$2452.05}{2 \times 248.20}$	=

Property line Mayfield to property line Mason Ave.

Cost property line to property line	2094.09	
Cost intersection Potomac Ave. & Mayfield	206.08	
Cost intersection Potomac & Mason Ave.	<u>211.76</u>	2511.93
Assessment per foot of property line =	$\frac{\$2511.93}{2 \times 248.20}$	=

Property line Mason Ave. to property line Austin Ave.

Cost property line to property line	2070.33	
Cost intersection Potomac Ave. & Mason Ave.	211.76	
Cost intersection Potomac Ave. & Austin Ave.	<u>181.79</u>	2463.89
Assessment per foot of property line =	$\frac{2463.88}{2 \times 248.20}$	=



## Sheet Asphalt Pavement

Width of Roadway 30 ft. 0'in.

	volume cut cu. yds.	volume fill cu.yds.	curb and gutter- feet	Pavement sq.yds.	Gutter cut cu. yds.
Property line Menard Ave. to property line Mansfield Ave.	202		532.75	330	19.75
Property line Mansfield Ave. to property line Mayfield Ave.	236		532.4	828.5	19.7
Property line Mayfield Ave. to property line Mason Ave.	315		532.4	828.5	19.7
Property line Mason Ave. to property line Austin Ave.	222		532.4	828.5	19.7



## Property line Menard Ave. to property line Mansfield Ave.

Excavation	222 cu. yds.	at	.58	\$128.76	
Curbing	532 .8 feet	at	.72	383.62	
cinders	20 cu. yds	at	.69	13.80	
Pavement	830 sq. yds	at	1.75	1452.50	
6% Engineering and attorney fees				<u>118.72</u>	\$ 2097.40

## Property line Mansfield Ave. to property line Mayfield Ave

Excavation	256 cu. yds.	at	.58	148.48	
Curbing	532.4 ft.	at	.72	383.33	
Cinders	20 cu. yds at		.69	13.80	
Pavement	828.5 sq. yds.	at	.1.75	1449.87	
6% Engineering and attorney fees				<u>115.17</u>	2034.65

## Property line Mayfield Ave. to property line Mason Ave.

Excavation	335 cu. yds	at	.58	194.30	
Curbing	532.4 ft.	at	.72	383.33	
Cinders	20 cu. yds.	at	.69	13.80	
Pavement	828.5 sq. yds.	at	1.75	1449.87	
6% Engineering and attorney fees				<u>122.48</u>	\$2163.81

## Property line Mason Ave. to property line Austin Ave.

Excavation	242 cu. yds	at	.58	140.36	
Curbing	532.4 ft.	at	.72	383.33	
Cinders	20 cu. yds.	at	.69	13.80	
Pavement	828.5 sq. yds.	at	1.75	1449.87	
6% Engineering and attorney fees				<u>119.24</u>	\$ 2106.60

Grand total-- \$ 8402.46



Hirsch St. Cont'd)

Assessment per foot on property on Hirsch St.

Property line Menard Ave. to property line Mansfield Ave.

Cost property line to property line	2097.40	
Cost intersection Menard Ave. & Hirsch St.	193.84	
" " " Mansfield Ave. " "	<u>188.40</u>	\$ 2479.64
Assessment per foot on property line =	$\frac{2479.64}{2 \times 248.37}$	= \$4.99.

Property line Mansfield Ave. to property line Mayfield Ave.

Cost property line Mansfield to property line Mayfield Ave.	\$2034.65	
" intersection " and Hirsch St.	188.40	
" " Mayfield " " "	<u>198.81</u>	2421.86
Assessment per foot on property =	$\frac{2421.86}{2 \times 248.20}$	= \$4.88.

Property line of Mayfield Ave. to Mason Ave. property line.

Cost property line to property line	2163.81	
Cost intersection Mayfield and Hirsch St.	198.81	
Cost intersection Mason & Hirsch Sts.	<u>188.46</u>	2551.08
Assessment per foot on property =	$\frac{2551.08}{2 \times 248.20}$	= \$5.14.

Property line Mason Ave. to property line Austin Ave.

Cost property line to property line	2106.60	
" intersection Mason Ave. & Hirsch St.	188.46	
" " Austin Ave. " "	<u>191.78</u>	2486.84
Assessment per foot on property =	$\frac{2486.84}{2 \times 248.20}$	= \$ 5.01





Le Moyne St.  
 Sheet Asphalt Pavement  
 Width of Roadway 30 ft 0' in.

	Volume cut cu yds.	Volume fill cu. yds.	combined curb & gutter	Pavement sq. yds.	Gutter cut cu. yds.
Property line Menard Ave to property line Mansfield Ave.	433		532.75	830	19.75
Property line Mansfield Ave. 291 Property line Mayfield Ave.	291		532.40	828.5	19.7
Property line Mayfield Ave. 257 Property line Mason Ave.	257		532.4	828.5	19.7
Property line Mason Ave. to Property line Austin Ave.	268		532.4	828.4	19.7



## Property line Menard Ave. to property line Mansfield Ave.

Excavation	453 cu. yds	at	.58	252.74	
Curb	532.8 ft.	at	.72	383.62	
Cinders	20 cu. yds.	at	.69	13.80	
Pavement	830 sq. yds.	at	1.75	1452.50	
6% Engineering and attorney fees			<u>126.16</u>	\$	2228.82

## Property line Mansfield Ave. to property line Mayfield Ave.

Excavation	311 cu. yds.	at	.58	180.38	
Curb	532.4 ft.	at	.72	383.33	
Cinders	20 cu. yds.	at	.69	13.80	
Pavement	828.5 sq. yds.	at	1.75	1449.87	
6% Engineering and attorney fees			<u>121.64</u>		2149.02

## Property line Mayfield Ave. to property line Mason Ave.

Excavation	277 cu. yds	at	.58	160.66	
Curb	532.4 ft.	at	.72	383.33	
Cinders	20 cu. yds	at	.69	13.80	
Pavement	828.5 sq. yds.	at	1.75	1449.87	
6% Engineering and attorney fees			<u>120.46</u>		2128.12

## Property line Mason Ave. to property line Austin Ave.

Excavation	288 cu. yds	at	.58	167.04	
Curb	532.4 ft.	at	.72	383.33	
Cinders	20 cu. yds.	at	.69	13.80	
Pavement	828.5 sq. yds.	at	1.75	1449.87	
6% Engineering and attorney fees			<u>120.84</u>	<u>2134.88</u>	

Grand Total 8,640.84



Assessment per foot on property Le Moyne St.

Property line Menard to Mansfield Ave.

Cost property line to property line	\$ 2228.82	
Cost intersection LeMoyne and Menard Ave.	195.62	
" " " " " " Mansfield Ave.	<u>186.71</u>	\$ 2611.15

Assessment per foot property line =  $\frac{2611.15}{2 \times 248.37} = \$5.26$

Property line Mansfield to property line Mayfield Ave.

Cost property line to property line	2149.02	
Cost intersection Le Moyne & Mansfield	186.71	
" " " " Mayfield	<u>197.78</u>	2533.51

Assessment per foot property line =  $\frac{2533.51}{2 \times 248.20} = \$5.10.$

Property line Mayfield to property line Mason Ave.

Cost property line to property line	2128.12	
" intersection Le Moyne & Mayfield	197.78	
" " " " Mason	<u>204.08</u>	2529.98

Assessment per foot on property \$5.09.

Property line Mason Ave. to property line to Austin Ave.

Cost property line to,property line	2134.88	
" intersection Le Moyne and Mason	204.08	
" intersection " " and Austin	<u>185.33</u>	<u>2524.29</u>

Assessment per foot on property \$5.08.



Summary  
for  
Estimate of Cost

Division Street.....	15236.84
North Ave.....	22848.02
Menard Ave.....	20176.19
Mansfield Ave.....	20451.89
Mayfield Ave.....	20322.93
Mason Ave.....	20326.61
Austin Ave.....	20933.66
Potomac Ave.....	8311.23
Hirsch Street.....	8402.46
Le Moyne St.....	<u>8640.84</u>

Grand Total-- 165,550.67





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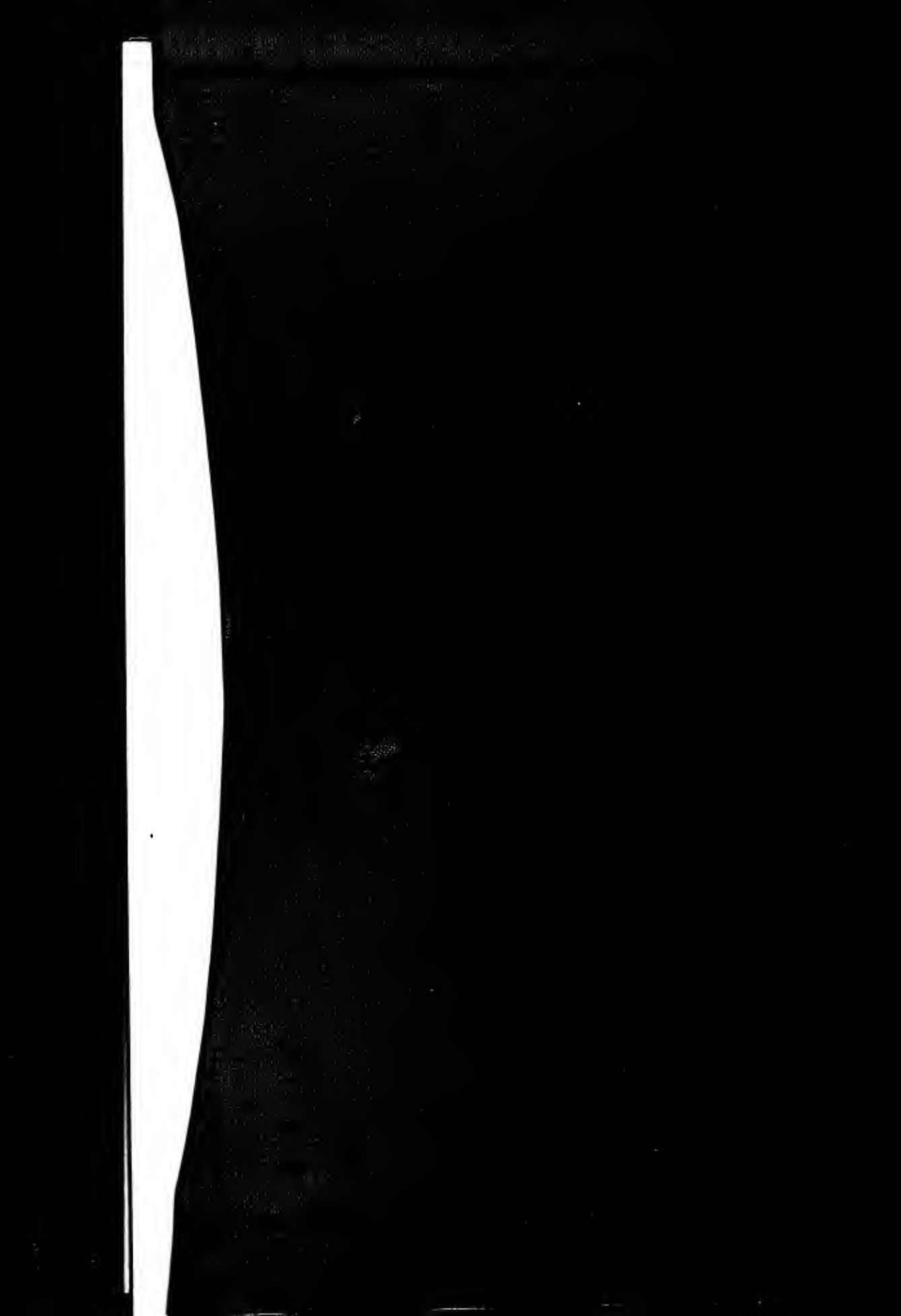


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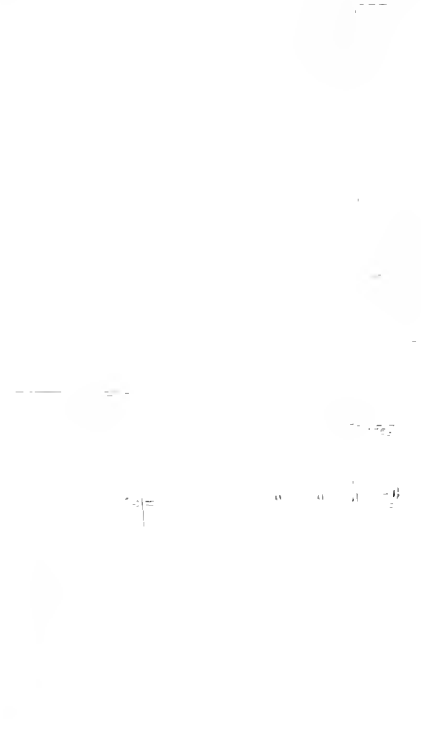
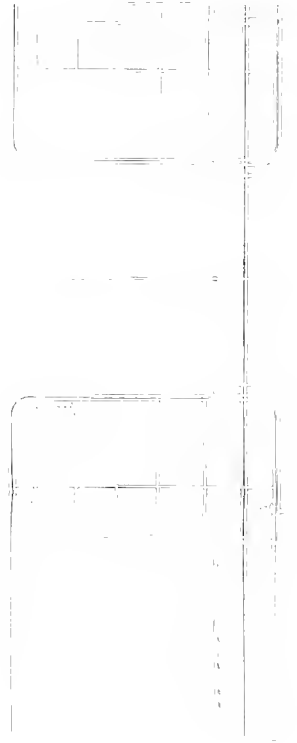
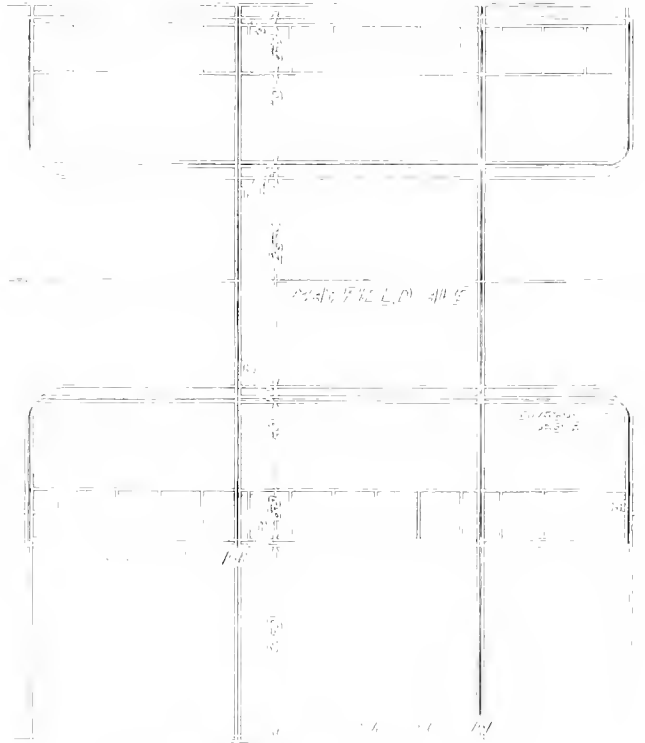
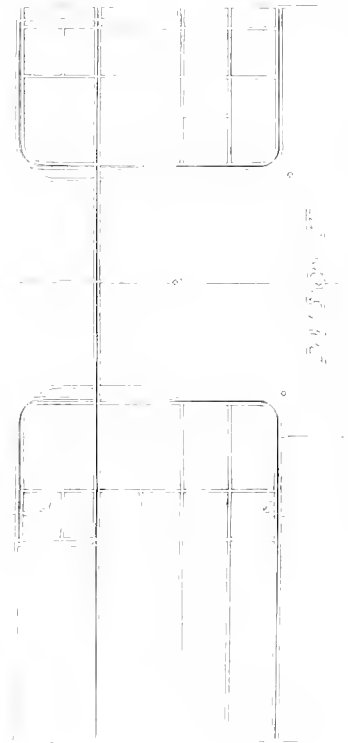
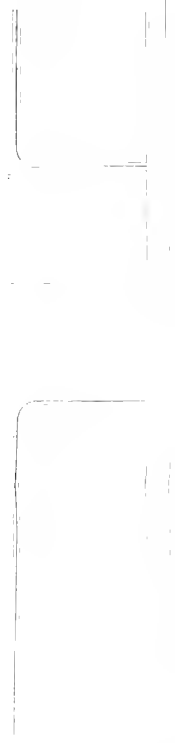


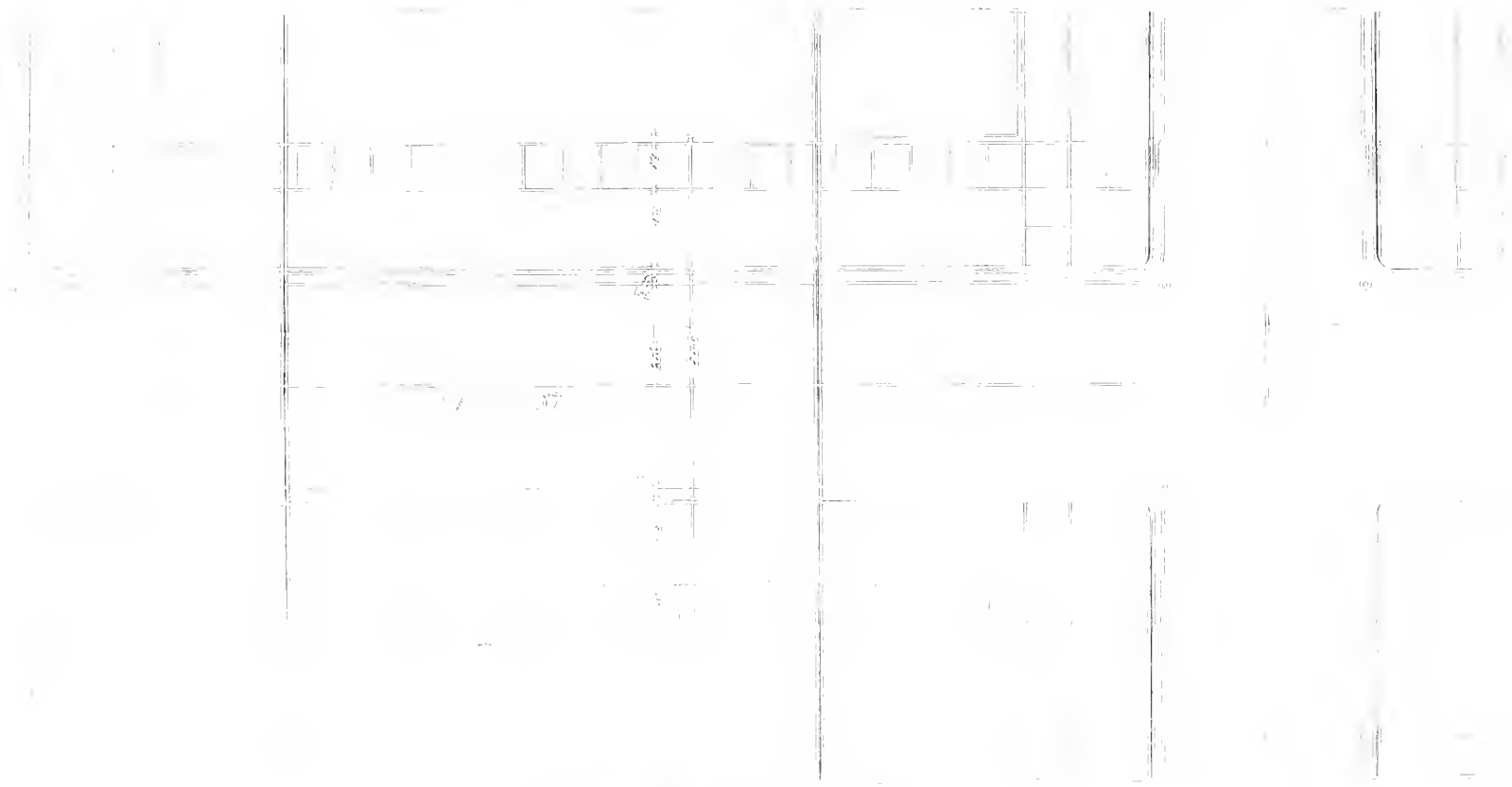




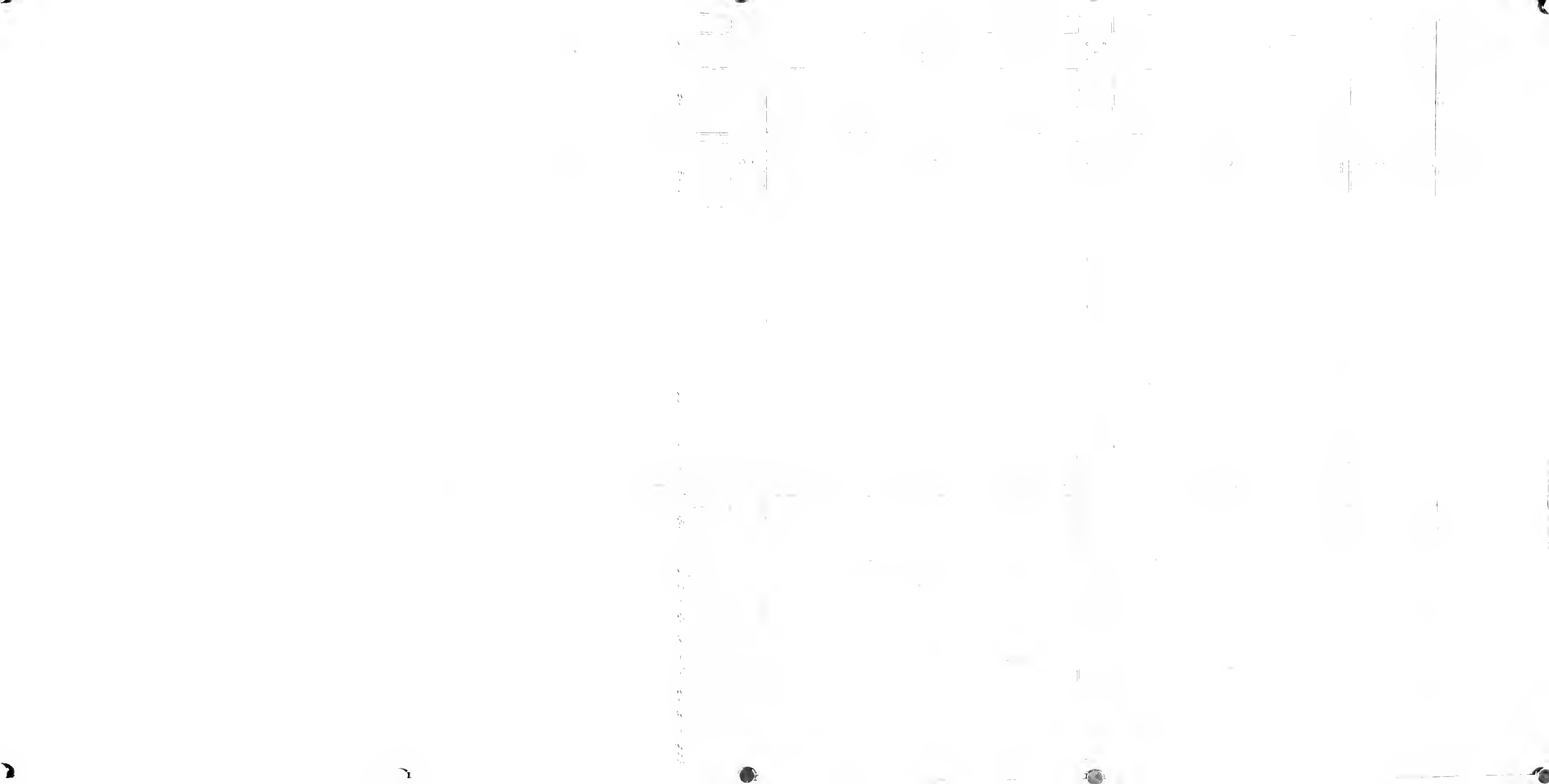




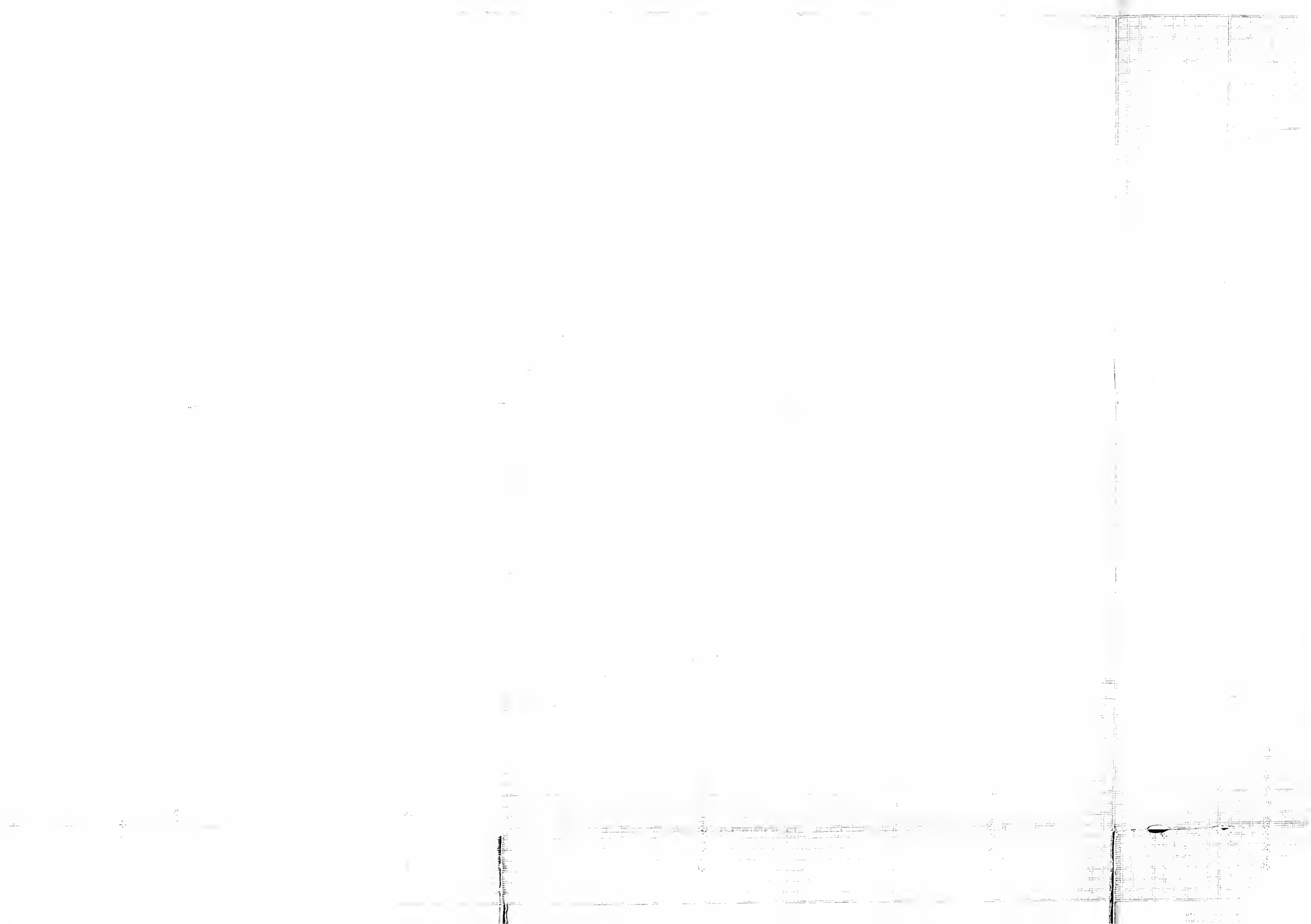














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